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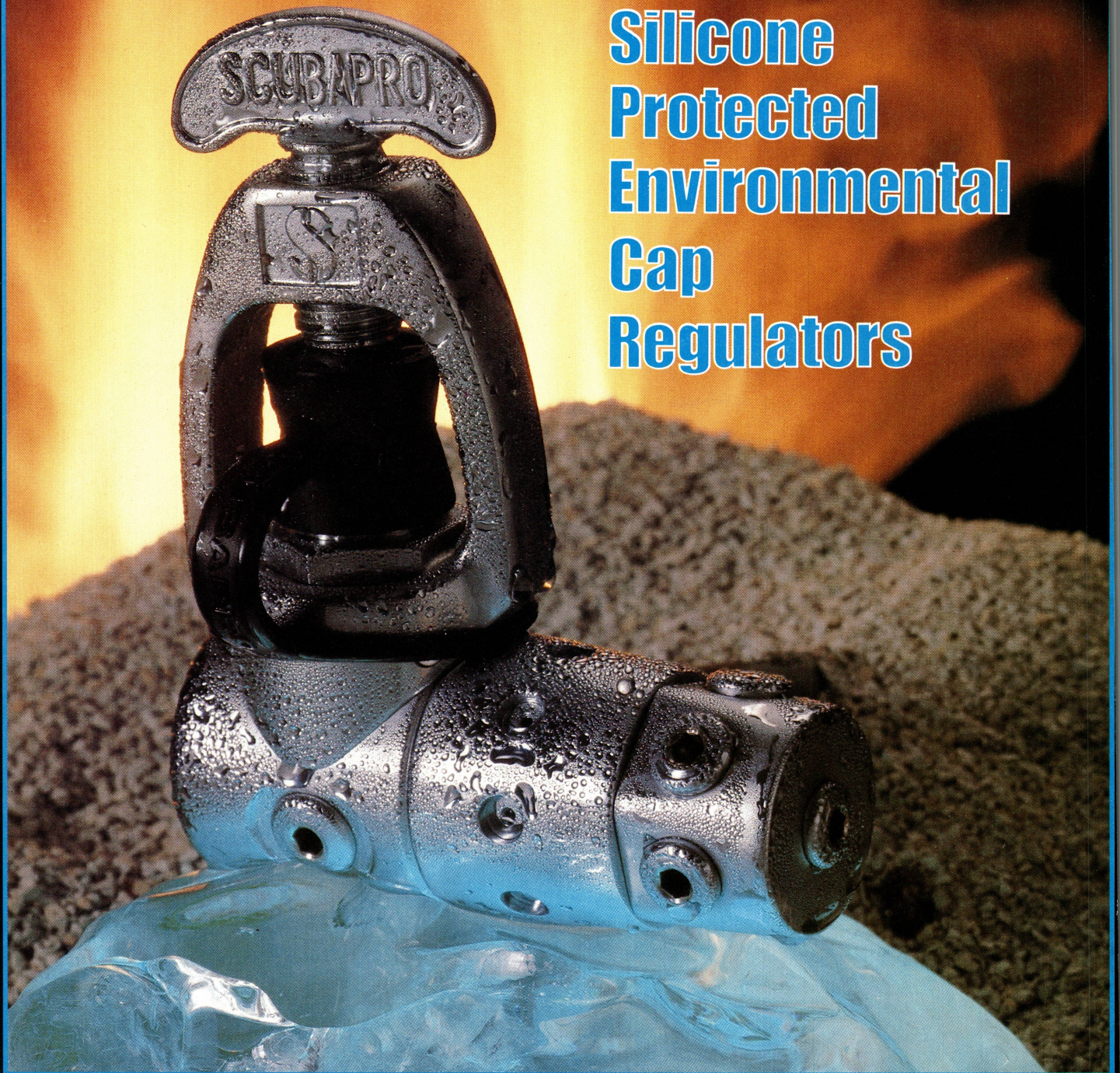


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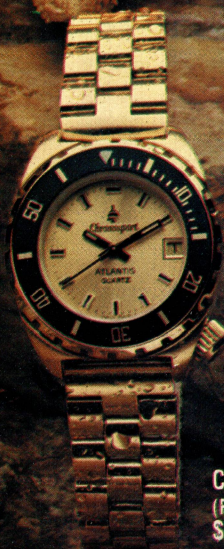
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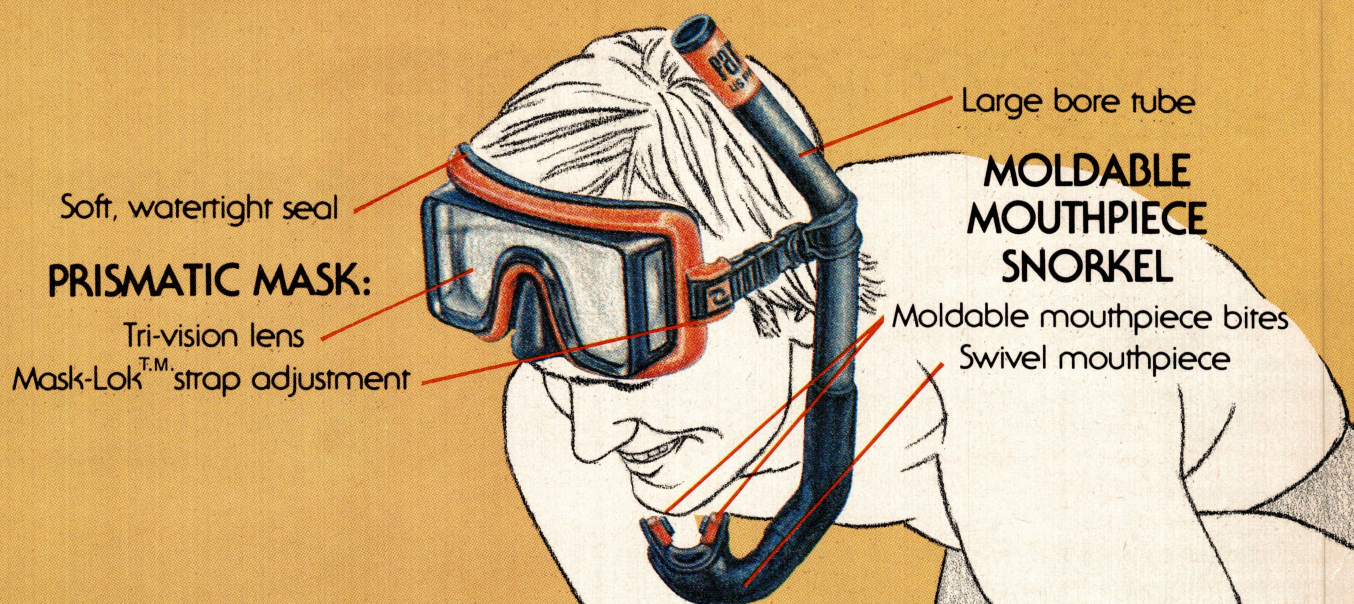
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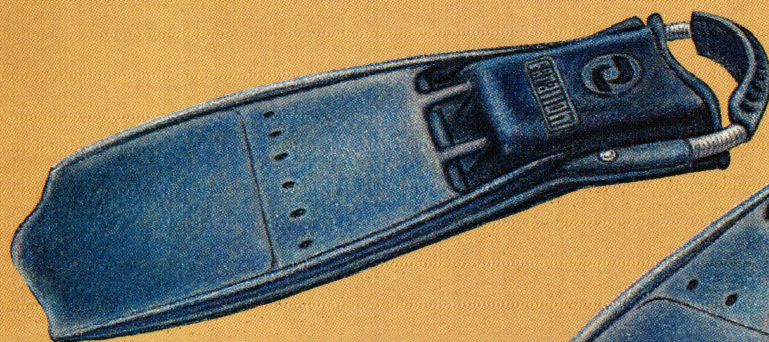


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skin diver

Volume Thirty-One Number Two

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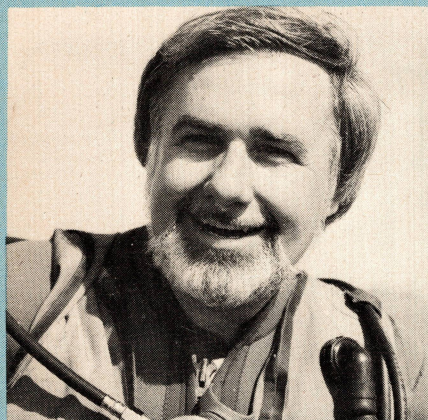
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COVER

California divers, Al Hornsby and Melanie Vincz, enjoy a sunset snorkel interlude at Seven Mile Beach on Grand Cayman Island. Photo/Geri Murphy. For more information about diving in the Cayman Islands, see the Cayman Travel Guide starting on page 65 in this issue. The story presents the best of Cayman diving, accommodations and entertainment. This vacation mecca has something for everyone from relaxing in the tropical sun to exciting nighttime activities. And from sailing to diving.



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SDM Editorial

BY THE PUBLISHER

DIVERS DON'T DO DRUGS

“What would happen if a diver took drugs and then went underwater?” This question is typical of the inquiries received from some of our newer readers. Many instructors categorically condemn all drug usage while diving. Most experienced divers just naturally assume the underwater effects of drugs would be extremely dangerous.

But theory may not be a good enough answer for the curious inquirer. Exactly what does happen to a diver on drugs? Unfortunately, there is not much information published on the effects of drugs underwater, leaving authorities without valid answers.

Recognizing the fallacy of an arbitrary “no,” SKIN DIVER began its own investigation on the subject — compiling data from private interviews, confidential reports, and tracking down rumors which have circulated among the ranks of scuba instructors. What we stumbled upon turned out to be frightening and we can now state absolutely, undeniably, and emphatically — drugs and diving don't mix.

Although most drug users are reluctant to discuss their “trips” for fear of legal prosecution, the people we have come in contact with felt compelled to report their underwater experiences in hopes of warning others of the serious dangers involved. Here is what we found:

It is a popular misconception among drug users that marijuana is one of the “soft drugs” — not habit forming, quite controllable, relatively harmless, and probably less injurious than drinking alcohol. This is not the case as far as diving is concerned. Instead of discovering the much sought-after “beautiful trip,” the stoned diver encounters disappointment, misery and has a better-than-average chance of drowning.

A scuba instructor in Europe reported some unusually revealing facts about a series of experiments conducted by him and a group of friends. Under close observation, dives were made from 10 to 30 feet deep in 54°F water, using quarter-

inch wetsuits. After smoking just one marijuana cigarette, every diver experienced intense, intolerable cold which eventually drove him/her out of the water in a fraction of his/her normal exposure time. In most instances the divers could endure barely 10 minutes underwater when normally they felt comfortable for an hour or more.

A reduction in breathholding capability was also quite noticeable. The scuba instructor involved was an experienced free diver who could normally hold his breath for two and one-half to three minutes, but the effects of marijuana reduced this to a maximum of 30 seconds. He felt like a weak, out-of-shape beginner.

Perhaps the most dangerous effect of the marijuana was on the divers' minds and imaginations. All of the divers involved reported feeling great discomfort and irritation while underwater as well as an overwhelming urge to terminate their dives. Sudden movements of kelp with surge would induce near panic and a peculiar sense of unexplainable apprehension became a constant companion. They remained jittery throughout the dives.

The scuba instructor who was involved in the experiment provided an interesting insight into the diver's subconscious workings. Throughout his marijuana dive, the instructor could not dismiss a recurring thought about a shark attack which had happened seven years prior in an area approximately three miles from the present dive site. He simply couldn't shake the thought of this incident even though he had not seen a shark in the area during six years of repeated diving on this site. The instructor had never before been concerned about sharks and had encountered them several times while diving in other parts of the world. Yet on this day, while under the influence of marijuana, his concern built up to the brink of paranoia.

From this firsthand report it becomes obvious that marijuana is anything but a safe drug. It can amplify many of the un-

pleasant underwater stimuli which a diver trains so hard to overcome. Small things such as cold water, water up the nostrils, the urge to breathe, surge and water in the eyes can develop into insurmountable problems for the drugged diver. Minus rational thinking and physical stamina, the diver is an easy mark for panic. It is also quite apparent that the use of drugs while diving tends to release or reveal many of the diver's basic (and normal) fears which have been suppressed and buried deep in the subconscious. Marijuana could very well be the key that unlocks the door to your “monster closet.”

We've received another report (this one second hand) about a group of divers experimenting with marijuana in waters off Okinawa Island. The experiments were conducted several years ago and involved three or four divers who took turns observing the effects on one another. According to their reports, the effect was entirely different. In warm water the drug user becomes ultra-relaxed, sleepy, unaware, lazy and the ability to think or do work is reduced to nearly zero. They described this phenomenon as a “gray-out” — aware of things happening around you but unable to do anything about it. Upon reaching a depth of between 50 to 60 feet every one of the divers (at different times) became unconscious. They reported the experience as sort of simply going to sleep. Needless to say, this group of divers has ceased experimenting and warned all of its friends to do the same.

We recognize the fact that the effects of marijuana are bound to vary from one individual to another, and may be dependent on the strength or quality of the drug. However, the general effect is the same. Euphoria underwater does not await the drug user.

The myth of marijuana underwater has been exposed by those very users who were eager to experience the super trip. Don't self-experiment — it's been done and the results are disappointing. Don't try that first trip — it may be your last. >



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It must be tooth squeeze

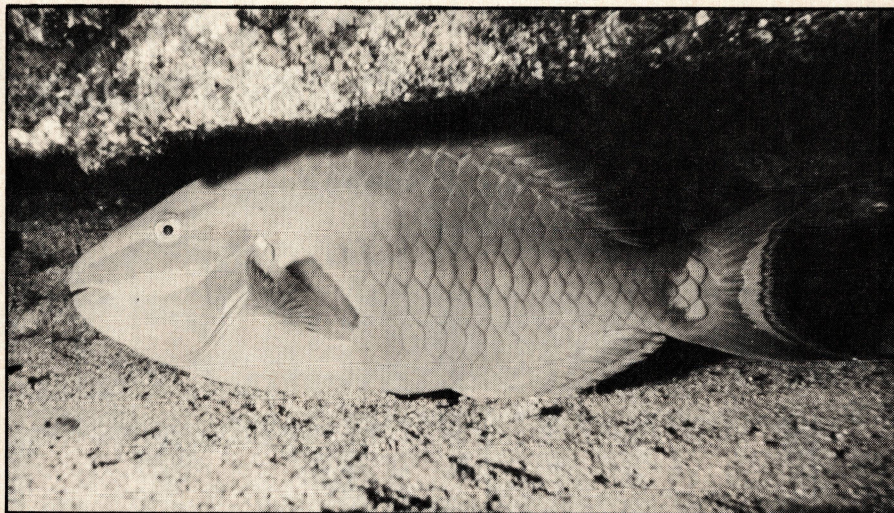
BY KENNETH ROTTMAN D.D.S.

Dentists are divers too. We come in all shapes and sizes and in all age groups. We take the tours with three dives a day and we have the same love and fascination for the sport as anyone else. Our one distinction is that an inevitable question is asked by our fellow passengers on the dive boat when our profession is revealed: "Say doc, I have a problem with one of my teeth after diving and my dentist says there's nothing wrong. It must be tooth squeeze."

The first thing that should be pointed

tive to changes in temperature rather than pressure.

Tooth squeeze has also been reported as being caused by a large periodontal lesion. That is an infection of the gum tissue that surrounds a tooth and forms a cuff of tissue referred to as a periodontal pocket. High pressure air entering that space would cause pain as it expanded upon ascent, but the pain would be quickly relieved since there is nothing to block its exit. Extensive periodontal disease is known as pyor-



out about tooth squeeze is that it is very rare. Not so rare that it doesn't exist, just unusual. From the dentist's point of view it can come from a small spot of decay or as we call it a carious lesion. This may be a small new lesion or a lesion around an old filling, known as recurrent decay. It is not, as some references say, caused by air trapped in a filling. If the air is within the filling it is not susceptible to pressure changes because of its hard container. If, however, it is along the side of a filling, then the mouth fluids and bacteria would soon invade the space and cause a recurrent lesion.

Tooth squeeze is a pain in a tooth that is experienced by a person in a situation where air pressure is changing, and usually subsides when the pressure returns to one atmosphere. The remission of pain doesn't have to be immediate and usually isn't. It may exist following certain dental procedures such as a recent extraction of a tooth or the placement of a large filling. The latter is sensi-



When not on the job, dentists enjoy other interests such as underwater photography.

ble. This disease is the cause of more tooth loss than any other disease.

Another dental procedure that the diver should be aware of is root canal therapy. In this treatment, which may take from one to several visits to complete, the dentist removes the soft tissue (pulp) from the central part of the tooth.

photos/Kenneth Rottman

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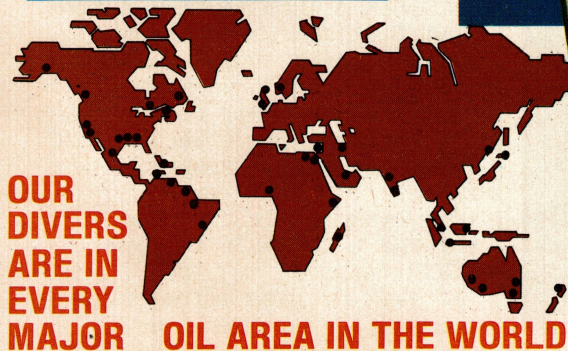
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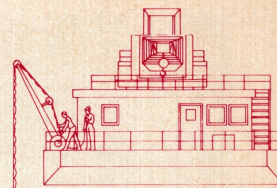
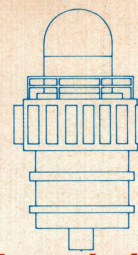
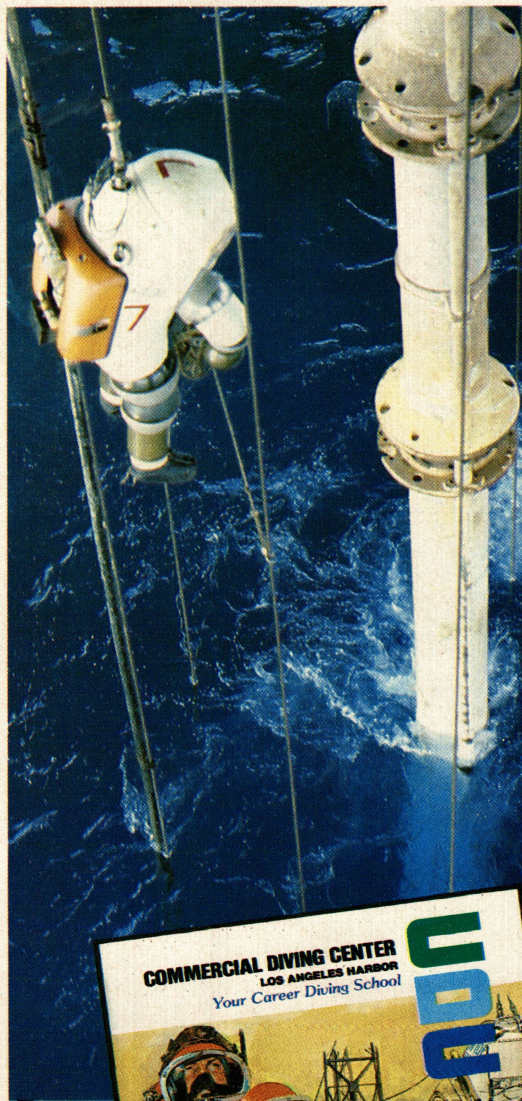
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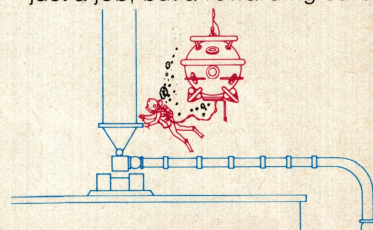
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TOOTH SQUEEZE

Teeth are hollow in the center because as they are formed they entrap the tissue forming the dentin. The chamber that is formed is the pulp canal or root canal since it exists mainly in the roots of teeth. The dentin, being harder than bone, entombs this tissue, which contains a nerve and blood vessels, and thus protects it. Should decay or a fracture expose this tissue, all of the remaining soft tissue is removed by the dentist and the empty canal is treated with medicaments and then filled with a sealant. This prevents future bacterial invasion to the bone that holds the tooth.

Root canal therapy is now a well accepted treatment worldwide. The problem specific to divers is that part of the procedure is to dry and seal the canal between office visits with a material that is known to be adequate at one atmosphere of pressure. If a diver were to put the sealant to the test at four, or even five atmospheres of pressure, there could be an air leak in which the high pressure air would enter the canal while the diver was at depth. As the ascent takes only a few minutes, the high pressure air would not have an equivalent time to escape the semisealed chamber and would rapidly expand. The canal would then be open for the remainder of the dive trip or until dental help could be obtained. This mechanism also may be the explanation for tooth explosion.

To recap, the causes of tooth squeeze are:

- 1) Small carious lesions.
- 2) Recurrent caries (decay) around the edges of existing fillings.
- 3) Large areas of decay where the pulp is infected.
- 4) Periodontal infections (pyorrhea).
- 5) Recent extraction sockets.
- 6) Recently placed fillings.
- 7) Sinus congestion — actually sinus squeeze, but many divers have reported this as tooth squeeze.

Because most dentists are not scuba divers themselves, they are not aware of the pressures their scuba diving patients are likely to put upon their teeth in the form of compressed air. An organization now being formed in Chicago is the Society of Baro (Medicine & Dentistry). The organization's purpose is to make the special problems of scuba divers known to the dental profession so that tooth squeeze will become even rarer and perhaps disappear. It is, in all cases, preventable and need never be a bother to the diving community.

The Diving Dentists Society, Inc. (Suite 208, 1101 N. Calvert St., Baltimore, MD 21202) has been in existence since 1977. Readers can contact it for answers to specific dental problems.

Piuma

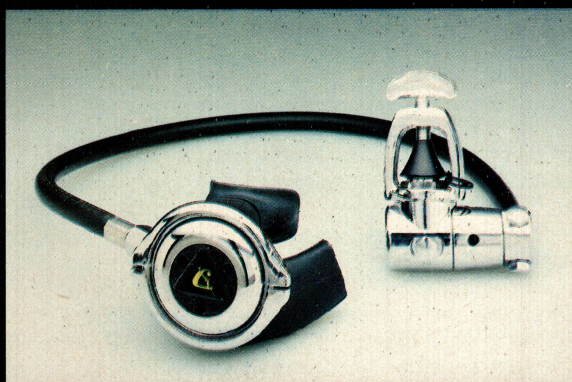


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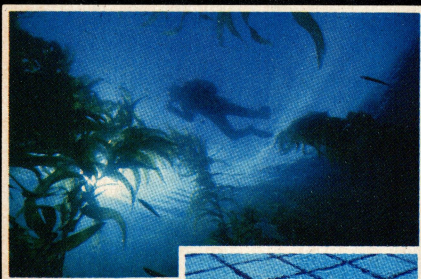
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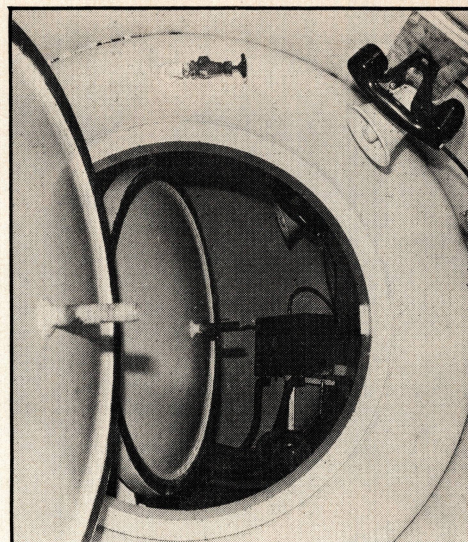


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202

Metal Monster

BY PATRICIA VANIK



photo/Gary Parsons

Clang . . . the heavy door closed behind us. "Prepare to leave the surface." "Ready to leave the surface." Whoosh!!! The air came rushing in. I felt the telltale need to equalize my ears and instinctively pinched my nostrils closed as I had been taught in class. "Holding at six zero feet," said the crackling voice over the intercom. "Holding at six zero feet," confirmed the inside tender.

This was the culmination of our one day exposure to the hyperbaric chamber in a program entitled, Chamber Orientation, offered by the Professional Diving School of New York — the diver training division of IUC. It had been an intensive program designed by PDSNY's director, Glenn Butler, and training director, Gary Parsons, to answer the sport diver's questions about the recompression chamber.

Prior to this day's experience I had envisioned the chamber to be a metal monster that swallowed divers in a single gulp and if they were lucky, would spit them out cured. But today I learned just how practical and important a piece of equipment it really is. We were taken through a thorough introduction of what a chamber is, where they are, and how to contact them. These last two topics stressed the important consideration that dive planning begins long before the day of the dive. You must know where the nearest chamber is, whether or not it is operational, how to notify the chamber personnel and ancillary support, and the fastest route of transportation.

Next, Glenn Butler — who is well known for his work in the design and construction of hyperbaric systems capable of simulating depths beyond 1000 feet, and the physiological effects of pressure on the diver — took us through a simple and practical procedure for in-field diagnosis of a potential diving accident victim. We learned to check the victim's balance, coordination and strength in the extremities, eye movement and vision, sensation to

touch and pin prick, hearing, orientation to time, place and persons. It was a thorough examination, yet the common sense way in which it was presented made it simple to understand and remember.

Then, Gary Parsons — who has worked as a commercial diver for the last 12 years and has been involved with the training of sport divers since 1969 and commercial divers since 1973 — explained the various modes of transportation available and the importance of first aid for a victim. We learned the reasons for the slanted, tilted body (Trendelenberg) position. We learned of the medical reasons and importance behind the administration of oxygen, and we learned the importance of following fast, efficient, pre-established guidelines to assure the victim's arrival at the chamber facility in a minimum amount of time.

Now we were ready to see the chamber itself! We moved from the classroom to the Professional Diving School's training barge moored along the shoreline of the IUC world headquarters in City Island, New York at the western end of Long Island Sound.

IUC's massive 7.2 acre facility is shared by the Professional Diving School. As we walked to the water's edge we passed commercial divers at work in the yard preparing such things as saturation systems, diving bells and deep diving submersibles. An entire crew was busy installing a huge, twin 1000 foot ocean simulation facility (formerly the U.S. Navy's Experimental Diving Unit in Washington, D.C.). This system will be used to train divers in advanced deep diving and bell operations.

When we reached the training barge, moored in 30 feet of water over dozens of underwater projects, we were introduced to Lee Daversa. Lee is the chief instructor at PDSNY and was a diver in the United States Navy for nine years. He explained the set up of the school's

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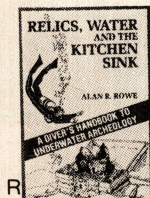
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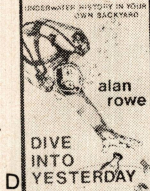


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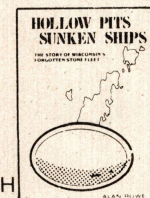
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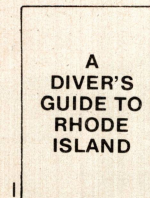
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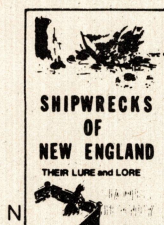
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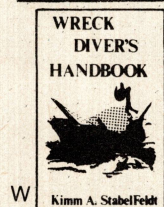
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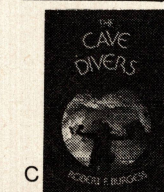
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METAL MONSTER

double-lock deck decompression chamber (DDC) which is typical of a small portable system such as those found on some of the islands in the Bahamas and Caribbean. We were shown the chamber locking systems and we saw oxygen level meters, communications systems, first aid kits, blood pressure cuffs, otoscopes (for checking the ears) and simulated intravenous devices.

The next part of the program was a simulated treatment of an injured diver. The actors were some of the current students at PDSNY, people from all over the world. We were told this would show us what to expect when a victim and his transporters arrived at the chamber facility. We find that the personnel, having been previously contacted, have the chamber thoroughly checked out and are ready to accept the victim. One attendant meets with the transporters to establish the history of the dive while two others hover over the victim. They make physiological and neurological checks: blood pressure, pulse, respiration, ear condition, reflexes, coordination and strength. If the victim is conscious they try to establish additional accident background. From all this a diagnosis can be made and the proper treatment procedure can be chosen. Now the victim is placed in the chamber, the door is closed, and pressurization can begin.

Now it is our turn. The course is finished with each of the students being pressurized to 60 feet. We experience the heat of compression (Charles' Law); the noise of ventilation, the increased density (we are all asked to whistle — it's impossible in the thicker air!); and the cold fog of depressurization. It's not as bad as I had thought! And to think that this entire experience had cost us each about the price of an open water dive.

This course is available to divers who have shown they are serious about the sport by signing up for advanced training. I found out that similar classes have been held for instructors and their students enrolled in advanced, dive-master, assistant instructor, search and recovery, and deep diver programs. The course can be arranged by contacting the Professional Diving School of New York at 222 Fordham Street, City Island, New York 10464; (212) 885-0600.

"Ready to leave the bottom," crackled the voice on the intercom. "Ready to leave the bottom," repeated the inside tender. "On the surface," crackled the voice on the intercom. "On the surface, all divers OK," repeated the inside tender.

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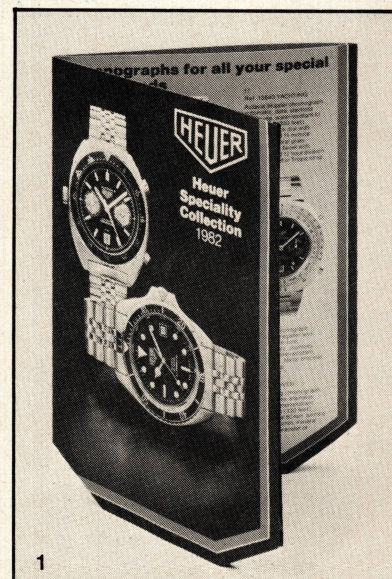


Color poster and catalog free on request

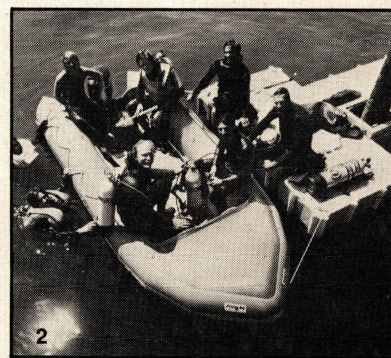
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New Gear



1



2

1 Watch Catalog—Heuer Time and Electronics is offering a free catalog. The 1982 edition of the Specialty Collection features a wide variety of analog and digital watches from simple, day/date diver's models to multi-function styles. From Heuer Time and Electronics Corp., 960 S. Springfield Ave., Springfield, NJ.

2 Inflatable Boat—The Avon Sportboat, \$4.60, is 15 feet long and perfect for divers. Low freeboard allows easy swim-aboard convenience; the wide beam is stable to prevent overturning; and the entire boat is light enough for hand carrying. \$2995. Available from Seagull Marine, 1851 McGraw Ave., Irvine, CA 92714.

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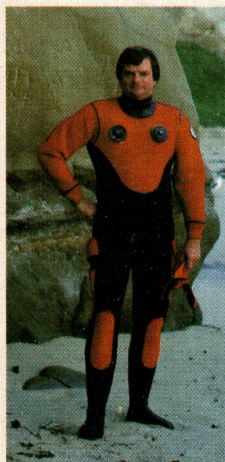


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Diver's Calendar

February 6-13 Medicine of Sport Scuba Diving course, Flamingo Beach Hotel, Bonaire, NA. Emphasis on medical preparedness for diving emergencies. (Contact: Medical Seminars, Inc., 11406 Whisper Moss, San Antonio, TX 78230; (512) 492-5656)

February 13 Sea State '82 symposium, Portland State University, Portland, Oregon. Sponsored by the Tide Riders Scuba Club. Tickets \$6 in advance and \$7 at the door. (Contact: Sea State '82, P.O. Box 774, Tualatin, OR 97062)

February 27 Sixth Annual Divers Showcase, Lansing City Center. Artifacts, equipment, slides, dinner and film fest. Senior citizens free. (Contact: Capitol City Dive Club, P.O. Box 1055, East Lansing, MI 48823)

February 27-March 7 A diving medicine course at the Flamingo Beach Hotel, Bonaire, NA. Emphasis on identification of marine animals that inflict wounds. (Contact: Dive-Med International, The Gruhn Bldg., 3001 S. Hanover St., Baltimore, MD 21225; (301) 355-1903)

March 11-14 Underwater Canada '82, at the Constellation Hotel, Toronto. (Contact: The Ontario Underwater Council, 160 Vanderhoof Avenue, Toronto, Ontario M4G 4B8; (416) 424-6911)

March 12-14 Twenty-eighth Annual Boston Sea Rovers U/W Clinic. Lectures, seminars and underwater films. (Contact: Glen Reem, 30 Rockville Ave., Lexington, MA 02173)

March 19-20 Fourteenth Annual Florida Skin Divers Association Underwater Film Festival, Sheraton-Tampa Hotel. Exhibits, U/W films, photo contest and guest speakers (including Paul Tzimoulis). (Contact: Holly Wagner, Chairman FSDA Film Festival, 1587 Oakadia Lane, Clearwater, Florida 33516)

March 20 Underwater New York—11th Annual Diving Seminar. Exhibits, artifacts and speakers. (Contact: Dick Zielinski, P.O. Box 4894, Syracuse, NY 13221; (315) 699-2004)

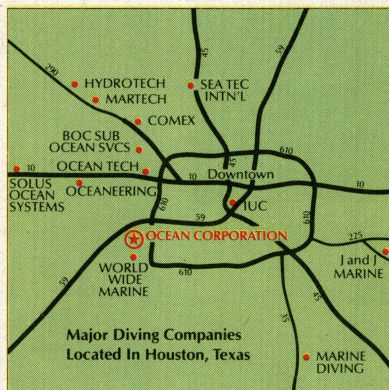
March 21 Second Annual Dive to Adventure With Jack McKenney, Glenbard North High School, Carol Stream, IL. Door prizes. (Contact: UnderSeas Scuba Center, 626 North Addison Road, Villa Park, IL 60181)

April 1 Deadline date for entries in the Ken Reed Memorial Photo Contest, sponsored by NAUI North Atlantic Branch. Winners will be announced at the Spring Film Review April 3. (Contact: Tracy Tibedo, P.O. Box 303, Astor Station, Boston, MA 02123)

Why Houston?

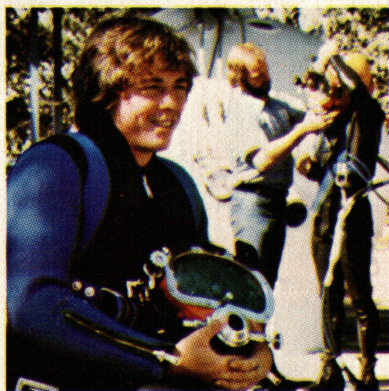
BECAUSE

The Ocean Corporation is located in Houston and more commercial divers are hired in Houston than in any other place in the world. Twelve diving companies are located in Houston including three of the four largest in the U.S. Many others are located in the nearby New Orleans area. The demand for divers is so great in Houston that large locally based diving companies like Ocean Systems, Hydrotech Systems, Martech International and Sea Tech International have hired many of our students for part-time work while they were attending school. Over 90% of our recent graduates went to work for these and other local diving companies when they completed our program. Houston is the place where the action is...the commercial diving, offshore construction and oil industry capital of the world.



BECAUSE

The Ocean Corporation is a commercial diving company, not just a school. Our facilities, equipment and training aids are the best, and our diving systems are as up-to-date as possible... because much of the equipment is used by our diving operations division to perform actual diving contracts in the field. Ocean Corporation has successfully completed many underwater jobs for various industrial clients over the years... including specialized underwater inspections, maintenance and repair work. For example, we did the world's first commercial underwater repair job in a nuclear power plant. And most of our divers have been graduates of our own school.



BECAUSE

The Ocean Corporation is a convenient and exciting place to go to school. Houston is one of the fastest-growing and most dynamic cities anywhere. It is a city of expansion, energy and youth (the average resident's age is in the mid-20's). Houston offers every conceivable kind of entertainment, from sports events, ultra-modern discos and open-air theater to rough-house local rodeos, chili cook-offs and the new Texas-size

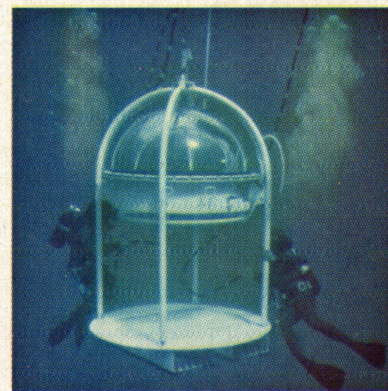


country-western dance clubs. Reasonably priced adult and singles apartments are readily available within walking distance of the school, and fast-food to luxury restaurants are nearby. The semi-tropical climate is wonderful, the sport diving is great and the folks are friendly.

BECAUSE

The Ocean Corporation management and instructor staff have long-term experience in the international offshore oilfield diving business. Retired ex-military divers and sport scuba divers don't run the school...commercial divers do. For example, the President of The Ocean Corporation, Larry

Cushman, was Vice President and Europe/Africa Area Manager for Ocean Systems, Inc. for three years...with responsibility for all North Sea diving and underwater construction operations. He also worked six years as a manager for Oceaneering International, Inc., another of the world's largest commercial diving contractors. Ocean Corporation managers and instructors know today's diving business...first-hand, from recent experience.



The Ocean Corporation

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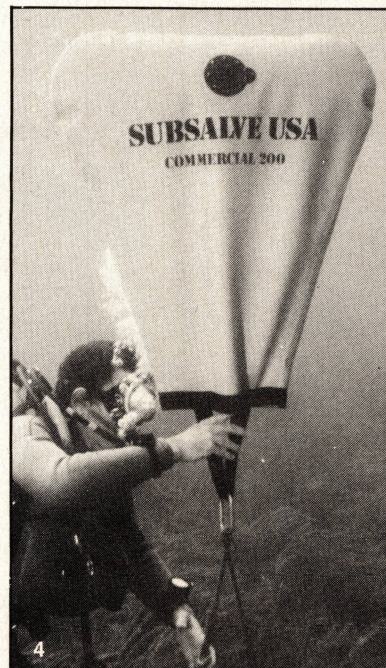
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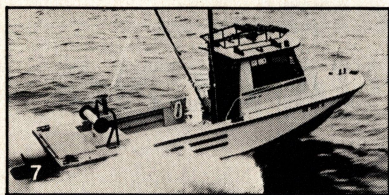
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3 Prescription Lenses—Permanently installed in your own facemask, these corrective lenses are contoured for maximum peripheral vision. Simply send in faceplate or complete mask with prescription required. Single vision \$50, bifocal \$100. From Accu-Lite Laboratories, 206 E. Wilson, Glendale, California 91206.

4 Lift Bag Catalog—Subsalve Industries of Providence, RI is offering a free, eight-page catalog for 1981-1982. The catalog introduces the new line of underwater lift bags and flotation devices from 100 to 20,000 pound capacity. For the free catalog write to Subsalve Industries, Inc., P.O. Box 9287, Providence, RI 02940.

5 Dive Light—Underwater Kinetics SE 200 rechargeable dive light combines small size (3.75" x 7.25") with high output. The light is available with pistol or bucket handle. The clear Lexan reflector cover allows visual check of the O-ring seal. \$69.95. From Underwater Kinetics, 7052 Convoct Ct., San Diego, CA 92111.

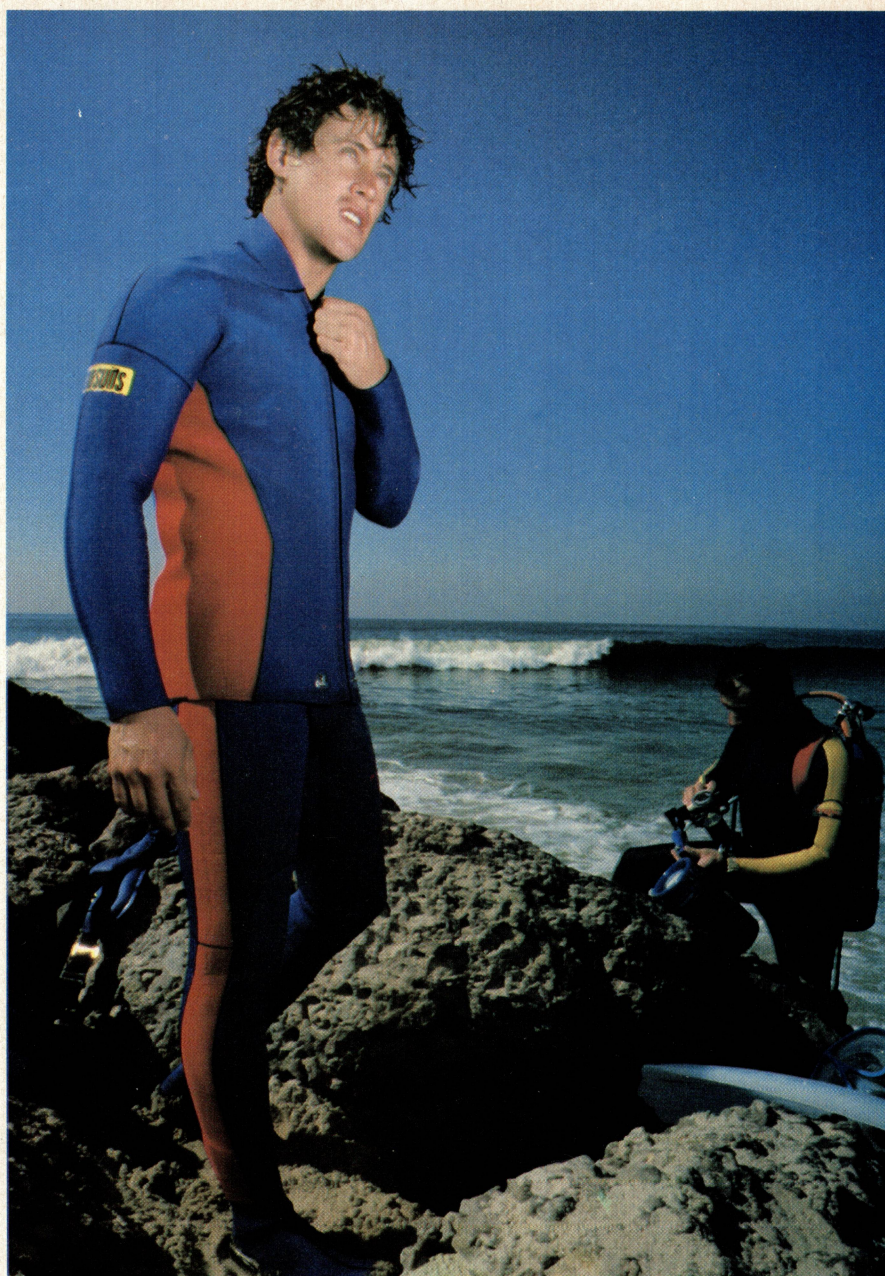


6 Film Packs—Fujichrome RH400 35 mm ASA 400 color slide film is now available in four roll Pro-Packs. The four roll packages are available with either 20 or 36 exposure rolls. The package of 20 exposure rolls costs \$24.40 and the pack of 36 exposure rolls sells for \$34.80. Available at Fuji Photo Film dealers.

7 Dive Boat—Boston Whaler's new dive boat, the Frontier 25, combines a working cabin (6'3" headroom) with a hinged door in the starboard side for easy diver entry. Available with gas or diesel sterndrive, or outboard engines. Outboard models start at \$24,450 (price varies with options). From Boston Whaler.

8 Note Cards—Featuring four different hand drawn underwater scenes, these note cards can be used for any occasion. Blank inside, the cards are perfect for divers who want to express their own thoughts. Ten cards with envelopes, \$3.95. At your dive shop. From Innovative Greetings, Inc., P.O. Box 237, Waitsfield, VT 05673.

9 Protective Coating—Scuba Armor is a new solution which helps protect rubber from ozone attack and age breakdown. Sprayed on and wiped off, it will retard cracking and splitting of rubber in any place that wear and stretch occur. Eight ounce container \$6.95. From Aqua-Craft, 7992 Miramar Rd., San Diego, CA 92126.



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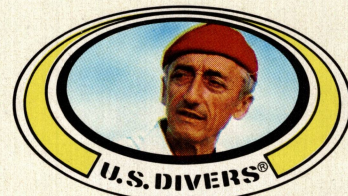
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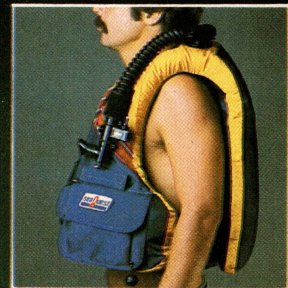
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DIVE TABLES

TABLE 1-END-OF-DIVE LETTER GROUP

START DEPTH IN FEET	NO-DECOMPRESSION LIMIT (NDL)	BOTTOM TIME REQUIRING DECOMPRESSION NO. MINUTES REQUIRED AT 10' STOP
40	5	15 25 30 40 50 70 80 100 110 130 150 170 200
50	10	15 25 30 40 50 60 70 80 90 100 140 160 210
60	10	15 20 25 30 40 50 55 60 70 80 90 100 140 26
70	5	10 15 20 30 35 40 45 50 60 70 80 90 100 140 23
80	5	10 15 20 25 30 35 40 45 50 60 70 80 90 100 140 23
90	5	10 12 15 20 25 30 35 40 45 50 60 70 80 90 100 140 23
100	5	7 10 15 20 22 25 30 35 40 45 50 60 70 80 90 100 140 23
110	5	10 13 15 20 25 30 35 40 45 50 60 70 80 90 100 140 23
120	5	10 12 15 20 25 30 35 40 45 50 60 70 80 90 100 140 23
130	5	8 10 15 20 25 30 35 40 45 50 60 70 80 90 100 140 23
140	5	7 10 15 20 25 30 35 40 45 50 60 70 80 90 100 140 23

ABT ACTUAL BOTTOM TIME
+RNT RESIDUAL NITROGEN TIME
TBT TOTAL BOTTOM TIME
(USE THIS FIGURE TO
DETERMINE END-OF-DIVE
LETTER GROUP.)

40	50	60	70	80	90	100	110	120	130	140	NEW GROUP	A	B	C	D	E	F	G	H	I	J	K	L	M	N
7	6	5	4	3	3	3	3	3	3	2	8	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
193	94	55	46	36	27	22	17	12	7	8	8	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10	2:10
17	13	11	9	8	7	6	6	6	6	5	5	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49	2:49
183	87	49	41	32	23	18	14	9	4	5	5	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40
25	21	17	15	13	11	10	10	9	8	7	3	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39	1:39
175	79	43	35	27	19	15	10	6	2	3	3	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
37	29	24	20	18	16	14	13	12	11	10	10	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09	1:09
163	71	36	30	22	14	11	7	3	3	3	3	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55	0:55
49	38	30	26	23	20	18	16	15	13	12	12	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54	0:54
151	62	30	24	17	10	7	4	3	3	3	3	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46	0:46
61	47	36	31	28	24	22	20	18	16	15	15	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45	0:45
139	53	24	19	12	6	3	3	3	3	3	3	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41	0:41
73	56	44	37	32	29	26	24	21	19	18	18	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40	0:40
127	44	16	13	8	1	1	1	1	1	1	1	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37	0:37
87	66	52	43	38	33	30	27	25	22	20	20	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36	0:36
113	34	8	7	2	2	2	2	2	2	2	2	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33	0:33
101	76	61	50	43	38	34	31	28	25	22	22	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32	0:32
99	24	24	24	24	24	24	24	24	24	24	24	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31	0:31
116	87	70	57	48	43	38	34	31	28	25	25	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28	0:28
84	13	13	13	13	13	13	13	13	13	13	13	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27	0:27
138	99	79	64	54	47	41	36	31	26	22	22	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26	0:26
62	1	1	1	1	1	1	1	1	1	1	1	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25	0:25
161	111	88	72	61	53	45	38	31	24	19	19	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24	0:24
39	39	39	39	39	39	39	39	39	39	39	39	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23	0:23
187	124	97	80	68	58	49	40	32	24	18	18	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22	0:22
13	13	13	13	13	13	13	13	13	13	13	13	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21	0:21
213	142	107	87	72	61	51	42	33	24	17	17	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20	0:20

TABLE 3-REPETITIVE DIVE TIMETABLE

00 LIGHT FACE NUMBERS ARE RESIDUAL NITROGEN TIMES (RNT)
00 BOLD FACE NUMBERS ARE ADJUSTED NO-DECOMPRESSION LIMITS (ANDL) • ACTUAL BOTTOM TIME SHOULD NOT EXCEED THIS NUMBER

TABLE 2-SURFACE INTERVAL TIME (SIT) TABLE

TIME RANGES IN HOURS : MINUTES ©1981 NAUI

TTrue Confessions: When first I ventured into the Pacific Ocean, fresh from Michigan's inland waters, I was ever alert and fearful of only one thing. This same thing was also on my mind during my first few scuba certification sessions. However, once I got to the lecture on dive physiology, I realized that sharks were the least of my worries. Now I had to decipher and learn to use the repetitive dive tables. Novice divers suddenly faced with the U.S. Navy No De-

compression and Decompression Tables can easily be overwhelmed. So many tables, so many numbers! But, that was before there were any attempts to simplify and make the tables easier to use.

Today there is more than one approach to the repetitive dive tables. In January we showed you one way, this month we show you another. NAUI's new pocket tables, just released last September, have several interesting features. First, all three

no decompression limits tables, and part of the decompression tables, are on one side of a plastic card. The tables are color coded and have "navigation aids" in the form of arrows and lines to eliminate any possibility of a "wrong turn." Second, the waterproof cards are just five and one-quarter by six and one-quarter inches in size so they fit in most BC pockets. Thus, you carry them with you both above and underwater. Third, on the back of the tables is a dive planning and

recording worksheet that is actually a slate. You can write on it with an ordinary pencil or a grease pencil, above or below water, and erase it clean at the end of your diving day. Use it to record your bottom time and surface intervals. Also on the back is a handy list of terms and abbreviations along with their definitions.

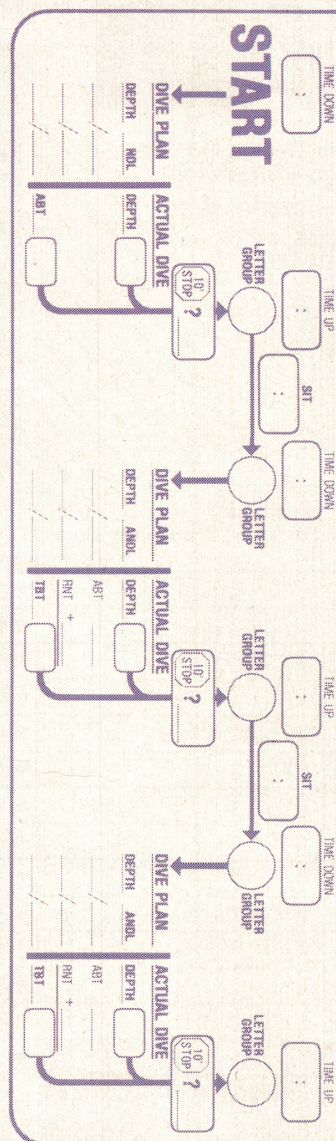
The man responsible for the design of these new tables is NAUI special projects director, Harry Averill, Jr. He describes them as,

A Compact
Design
You Can
Carry
In Your BC

By Bonnie J. Cardone

NAUI DIVE PLANNING AND RECORDING WORKSHEET

SINGLE DIVE



TERMS AND ABBREVIATIONS USED IN DIVE PLANNING

- Single Dive**—Any dive made more than 12 hours after a previous dive.
- Repetitive Dive**—Any dive made less than 12 hours after a previous dive.
- Depth**—The deepest point reached during any part of the dive.
- ABT**—Actual Bottom Time. On any dive, the time actually spent underwater.
- NDL**—No-Decompression Limit. On *Single Dives*, the maximum amount of Actual Bottom Time (ABT) you can spend at a particular depth, and still return to the surface without decompressing.
- Letter Group**—A letter symbol for the amount of Residual Nitrogen left in your system from previous dives.
- SIT**—Surface Interval Time. The time spent sitting on the surface between dives.
- RNT**—Residual Nitrogen Time. On *Repetitive Dives*, the amount of time you need to consider you've already spent underwater at the start of the dive, based on residual nitrogen left in your system from previous dives.
- ANDL**—Adjusted No-Decompression Limit. On *Repetitive Dives*, the maximum amount of Actual Bottom Time (ABT) you can spend at a particular depth, and still return to the surface without decompressing.
- TBT**—Total Bottom Time. The sum of Actual Bottom Time (ABT) and Residual Nitrogen Time (RNT). Following *Repetitive Dives*, use this figure to determine your End-of-Dive Letter Group.

REMEMBER

©1981 NAUI

- Consider all dives made shallower than 40' as 40' dives.
- On any dive, ascend no faster than 1 foot per second. That's as fast as your slowest rising bubbles.
- Always allow at least 10 minutes on the surface between dives.
- For maximum bottom times, make all Repetitive Dives to the same depth or shallower than your previous dive.

The NAUI waterproof dive tables are small enough to fit into the pockets of most BCs. The tables are color-coded for easy reading and the reverse side has a worksheet for dive planning.

"not just another set of tables, but a whole system to make learning to use the tables easier and less confusing."

They are, indeed, easier to use. Table 1 is entitled, End-of-Dive Letter Group. Starting at the far left, read down until you reach the depth of your dive. (Use the next greater depth if your dive was in between the depths listed.) Read to the right until you come to your bottom time. (Use the next greatest time if your time was in between the times listed.) The maximum amount of time you can spend at each depth without decompressing is circled. If you have exceeded that, the tables will tell you how long you need to decompress at ten feet: The number ten, the depth of the decompression stop, is in a white circle in a blue square; the time to be spent decompressing is a white number in a blue square. When you have determined your bottom time, continue down the column to find your group designation letter. (Group A has the least amount of bottom time, Group N has the most.) An arrow and a color-coded column lead you to Table 2, Surface Interval Time.

Surface Interval Time is given in hours:minutes. The longest possible surface interval time, 12 hours, appears at the head of the column; the shortest surface interval, ten minutes, is at the bottom. (Twelve hours after a dive your body has rid itself of nitrogen retained during the dive.) Determine your surface interval, then follow the arrow and line to the left to Table 3, Repetitive Dive Timetable.

There are two numbers in most squares on this table. The top, light face numbers

represent your Residual Nitrogen Time (RNT). The bottom, bold face numbers are the Adjusted No Decompression Limits (ADNL). The ADNL tells you how long you can stay down at any depth on a repetitive dive: It takes into account RNT from the previous dive and surface interval. As long as your Actual Bottom Time (ABT) does not exceed this time you will not have to decompress. Arrows, lines and color-coded columns lead you back to Table 1.

The NAUI tables have se-

veral built-in safeguards. All dives shallower than 40 feet are treated as 40 foot dives. No surface interval is to be less than ten minutes. Also, although the Navy tables figure bottom time as beginning on descent and ending when the ascent is begun, the NAUI tables figure it as the total time from surface to surface. Table users are told to make all repetitive dives to the same depth or a shallower depth than the previous dive.

According to Harry Averill, these tables are the first spe-

cifically designed for NAUI. There will be a slide series on how to use them, as well as a wall chart for instructors, available late this spring or early this summer. A pad of 50, 8 by 11 inch worksheets, punched for a three ring notebook, is available for \$4.00. The worksheet is a larger version of the one that appears on the back of the tables. The tables themselves sell for \$5.75 at your NAUI pro dive store or from NAUI Headquarters: 4650 Arrow Highway, Suite F-1, Montclair, CA 91763.

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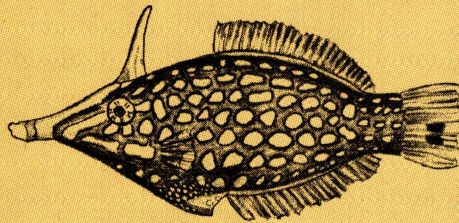
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The Longnose Filefish

(*Oxymonacanthus longirostris*)

In the oceans off Australia, through parts of the Indo-Pacific, throughout Micronesia, Melanesia, Polynesia (except Hawaii) and into the Red Sea, is a little green filefish with bright orange spots. Its scientific name, *Oxymonacanthus longirostris*, is derived from Latin and Greek words meaning sharp, single spine — long nose. These are partial but accurate descriptions of a fish that also has a long snout. □ Filefishes comprise the Monacanthidae family of fishes, although some ichthyologists place them together with the triggerfishes in the family Balistidae. Both have the single, long dorsal spine, but triggerfishes have an important secondary spine which moves forward to lock the first into place, like a trigger. The filefishes have no such mechanism. Filefishes also have more compressed bodies, with scales that are not as pronounced as those in the triggerfishes. The scales of filefishes have small spinules — minute spines — which give the fish a rough, leathery feel. Sailors of the past often dried the skins of filefishes and hung them by their galley stoves to use in striking matches. □ While *Oxymonacanthus longirostris* is the accepted scientific name for the longnose filefish, the Red Sea form was recently given a different subspecies name — *O. halli*. According to Dr. John McCosker of the Steinhart Aquarium, San Francisco, the Red Sea form differs from the Pacific form by a fin ray or two. The intermediate individuals — those found between the two extremes of the range — tend to intergrade. The extremes differ in coloration as well, says McCosker, and the intermediate locali-



ties show a combination, or variation, of the two color themes. Specimens from intermediate localities are presently being studied to determine if the variation is continuous or if there are distinct differences between *O. halli* and *O. longirostris*. In Australia, the fish is commonly called the beaked leatherjacket. □ Filefishes are not good swimmers and rely heavily on camouflage techniques. Therefore, even the established colors can change and spots disappear in an instant. A filefish going through the rigors of rapid fibrillations of dorsal and anal fins never seems to get very far, very fast.

Thus, the fish often hides, usually among staghorn corals, and relies on its ability to change colors.

□ The long snout of *O. longirostris* is well suited to its diet which consists primarily of coral polyps and sometimes the tiny animals that hide in narrow coral crevices. But because the longnose filefish prefers living coral above all else, it is difficult to keep in captivity. There are successful dietary substitutes for the coral polyps, but aquarists must still provide some sort of coral habitat for the fish to hide in — which it will do at night or when frightened. □ The longnose filefish is small, reaching a length of only two or three inches or a maximum of four inches. The juvenile is known to float with sargassum weed in the open ocean, hiding among the fronds as it drifts. The pelagic nature of its youth is a principal reason for the wide range of the species. By the time the fish has reached adulthood it will have settled down to life in the coral, usually pairing off with a mate, with which it stays faithfully. >

Photo By Chris Newbert - Text By Hillary Hauser

Chris Newbert took the photograph in the Red Sea. He used a Canon F-1, with a 50 mm macro lens, in a Farallon/Oceanic Hydro 35 housing and a Farallon/Oceanic 2003 strobe. ASA 25, shot at f16, 10 inches from subject.

Once upon a time there was a grocer named Chuck. He had his own store in San Diego, California called Chuck's Market. He was his own butcher, buyer and boxboy. Everyone said he had the best meat and produce in town and his list of happy customers grew and grew.

But along came Fate — which has a way of changing lives, even that of the successful grocer man. During Chuck's youth an ocean seed had been planted in his mind, one that was to bloom in later years. Instead of a grocery store, Chuck was to own a string of dive stores and he would become one

of the most successful underwater cameramen in the world.

The Chuck of this story is Chuck Nicklin, and today the grocery business is far behind him, totally replaced by film work that has included *Mysteries of the Sea*, *The Deep* and *For Your Eyes Only* — all of which he filmed under the direction of Al Giddings. Chuck is a tan-faced, laid-back, happy guy with an enormous white-toothed smile. He's the one you often see at dive congresses, festivals or meetings wearing loafers with no socks (his feet are tan, too). He'll be taking it easy, talking to friends he hasn't seen in

awhile, unhurried, unflustered and never anxious — yet his work load is enough to put most people on tranquilizers.

What is his secret? Priorities. While Chuck has produced more beautiful underwater film than most people will ever have time to see — both 16 mm, 35 mm and IMAX — he has no desire to climb ever-lengthening ladders to success. He doesn't want to produce or direct a film, become a wheeler-dealer, or see his name in corporate lights. He only wants to shoot film. On an enormous Hollywood project such as *The Deep*, you'll see Chuck taking a nap in the sun, waiting for



others to prepare for the next shot, the next plan or the next day. Chuck shoots film for anyone and gets along with everyone, because he does, as they say, his own thing.

Chuck Nicklin began diving at age 18, in La Jolla, California. He was originally from the East Coast but moved to San Diego while still in high school. One day, as he was climbing around the La Jolla cliffs, he saw a young boy playing in the tidepools of the cove below. The boy had a Japanese diving mask. Chuck saw it and asked if he could have a look through it. With that the seed was planted — a seed that grew.

A man with a desire
to be a good underwater
cinematographer...he is

CHUCK NICKLIN

By Hillary Hauser

Some time after Chuck had gone into the grocery business he was approached by a group of graduate students from Scripps Institution of Oceanography. The group wanted Chuck to join with them in a dive shop enterprise. They thought if Chuck could do well in the grocery business he'd do well in the dive business. Chuck listened to their plan, accepted it, and the Diving Locker of San Diego was born. Among the partners of this enterprise were Wheeler North, Andreas Rechnitzer, Jim Stewart and Connie Limbaugh — all notable dive pioneers. Since they were scientists they formed an official arm of the enterprise and called it Scientific Diving Consultants, Inc. — the dive store was the business end of the arrangement.

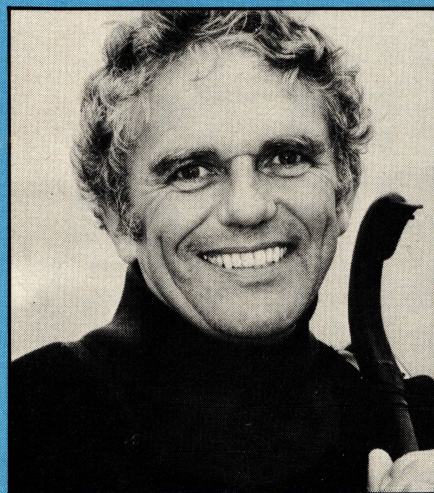
The Diving Locker opened on June 15, 1959 and what happened after that is history. Today there are four Diving Lockers (San Diego, Pacific Beach, Solana Beach and Escondido), and there is also the business called Nicklin Associates which consists of Chuck and his two sons, Flip and Terry.

Flip Nicklin is a well-known still photographer, his work often appearing in National Geographic. Terry manages the four dive stores. This association of father and sons is a tight threesome, a relationship that incorporates hard and fast business with imagination and creativity.

The story of the Nicklin dynasty reads something like the proverbial tale that begins with "Once upon a time" and ends with "happily ever after."

SDM: You've said that your dive store was your anchor while you got into film. Exactly how did you break in?

CHUCK: I started the same way as Al (Giddings), and a lot of other filmmakers I know. We were spearfishermen, then we discovered cameras and started taking pictures. Pretty soon SKIN DIVER Magazine published one; somebody hired us to do a little piece of film, and we took all of our money and bought film and cameras. First we'd shoot when we were off



photos/Flip Nicklin

on vacation. It grew from a hobby that cost money, to a hobby that paid for itself, to a hobby that paid part-time money, to a hobby that was a profession. It was a gradual transition, and it was easy for me to do because I had the dive store. Then there are the people like Flip who said, "I'll sell my car and buy some cameras and I'll see how far I can take it. I don't care about cars. I don't care about a house, I don't care about anything, I just want to do this." That takes a lot of guts. There are a hundred million photographers who all want to be professional photographers but most of them don't have the guts to really throw it all in and do it. The artist who wants to live in a garret and give it everything he's got is different from the guy who works all day and paints a little bit at night. If you're going to do it, you're going to do it.

SDM: How old is Flip?

CHUCK: Let's see... I'm 35, he's 31. He was born when I was four (Laugh).

SDM: What was the first film you ever made?

CHUCK: A film I did in the Los Angeles Bay, Baja California. I had so little knowledge of 16 mm shooting when I started that I turned the camera on its side and shot vertically. I had inherited this camera from Connie Limbaugh and the first time I used it was in Baja. I shot some whale sharks, interesting stuff, but to look

at some of the topside material you had to lean over sideways.

SDM: What year was this?

CHUCK: 1960.

SDM: How do you perceive yourself in the business of filmmaking?

CHUCK: I've never been into shooting films to make films. I really don't like post production — the editing, choosing music and so on. I just want to take a camera and put the best image possible on a piece of film. I don't always manage to do it, but that's what I want to do. When I work with Al, he is concentrating on 80 things while all I have to do is look at my camera, check my lights and get different angles. The only thing I have in my head is how I'm going to get a good image on that piece of film. The biggest advantage to this approach is that while everyone else is planning for the next day and getting headaches over it, I can take a nap. Almost everybody in the business wants to be a producer or a director. I don't. I just want to be a good underwater cinematographer.

SDM: Do you see a lot more activity in the field of underwater filmmaking?

CHUCK: They're talking about a sequel to *The Deep* and three more James Bond films. A lot of other things are coming up in the next few years that I'd like to work on. I think we'll be needed a lot.

SDM: So you're as busy as you want to be?

CHUCK: I recently got back from a big shoot and no sooner had I arrived home when someone wanted me to do something. I was complaining about it to my son Terry and he said, "Don't complain to me. All you have to do is say no." So I've learned to say no a little bit. There are two ways of saying no: no, I don't have time, or, I'll do it for umpteen dollars per day. You can price yourself up into the market where you don't have to work so hard. One thing I have learned to do is quit when I'm not working. When I come home, I garden. I have roses and orchids. I paint around my house and drive my little car and go to nice places for dinner. I'm not hot to go off and run around. This carries over to when I'm shooting, too. When we come out of the water, when other people start running around, I lay down in the sun and take a nap.

SDM: What about Nicklin Associates? How does this business work?

CHUCK: I do mainly film, and Flip is really hot on stills. He shoots primarily for Geographic but he shoots for other commercial clients, too. Flip is so busy that we have some other assistants working in our Nicklin and Associates to help cover some of the things we can't do. Terry is a hot businessman. He runs the stores. This is really rewarding to me. Most people don't want to do anything that their old man does.

SDM: Did you teach them when they were young; take them diving and put

(Continued on Page 36)

Chuck Nicklin (behind camera) films an underwater scene.



The Great Oyster War

**Chesapeake Bay
Becomes a Battleground
Pitting Tradition
Against Technology**

By Ellsworth Boyd



photos/Ellsworth Boyd

Commercial oyster divers in Maryland's Chesapeake Bay are quoting Shakespeare's famous lines from *The Merry Wives of Windsor*: "Why, then the world's mine oyster, which I with sword will open!" Figuratively, the Chesapeake Bay is the divers' oyster, and in opening it, they are provoking the wrath of the bay's venerable oyster tongers who claim squatters' rights dating back to 1820.

The tongers claim the bay as their oyster too, but the only objects they would like to "open with swords" are the divers' throats! The basic argument pits age against youth and tradition against technology, and the ensuing battle is reminiscent of the Maryland-Virginia watermen's boundary war of 1929. But in today's skirmish the only shots fired have been verbal, and rightfully so, because in many instances it pits father against son. The father is the elderly, experienced, traditional tonger and the son is the young, new-fashioned diver.

The oyster tonger is to Maryland what the lobster fisherman is to Maine — a symbol of the hard-nosed, freedom-loving mariner. His hand-operated tong resembles two very large rakes fastened together, teeth-to-teeth, to form a large pair of pincers. The handles are 18 to 30 feet long, depending on the water depth, although most tonging is done in 10 to 20 feet. The tonger drops the heavy, rake-like teeth into the water until the handles stand vertically in front of him. Then he spreads the handles apart, opening and closing the teeth until he feels them grabbing clusters of oysters. When he thinks he has enough, he slowly raises the tongs and dumps the catch on the culling board where his partner breaks the clusters apart, keeping the large oysters and throwing the small ones back.

The diver, on the other hand, simply glides along the bottom, selecting the largest oysters and dropping them into a wire basket that his partner hauls to the surface when full. The diver is much faster than the tonger, he is completely selective, and he never disturbs the bottom. The diver is more advanced than the tonger, both technically and environmentally, but the tonger clings steadfast to his role as a pioneer and symbol of a struggling industry.

It was inevitable that they would clash — the old sea dogs versus the young lions, in a heated debate in the bayside town of St. Michaels — the centrally located hub of the seafood industry on Maryland's eastern shore. The head-to-head confrontation lasted over two hours and was earmarked by vehement accusations and frequent interruptions. The meeting was initiated by upper eastern shore tongers, who asked Robert C. Haddaway, vice-president of



photos/Nick Caloyianis

Opposite, Ed Sherrer takes time to sample some of his delicious catch. Left, Joe Dorsey hauls in part of a day's harvest. Upper, Joe separates oysters from attached materials and selects those he will keep. Lower, a double oyster (note two white-lined openings) with anemones growing underneath. Competition between oyster fishermen using traditional methods and divers using more efficient techniques has resulted in a heated debate over this valuable resource in Chesapeake Bay. Regulations governing the harvest of these bivalves have come under heavy attack from both groups.

photo/Wayne Brady

the Talbot County Watermen's Association, to direct it. As mediator, Haddaway had his hands full trying to control 200 tongers and divers.

From the Free State's capital in Annapolis, the Department of Natural Resources sent William "Pete" Jensen, director of tidal fisheries. Also in attendance were Roy Dyson from Maryland's House of Representatives, state senator, Frederick Malkus, and delegate Henry Thomas.

The shaft tongers contend that divers are driving them off the oyster bars and squeezing them out of the market. They say that divers are taking brood stock from waters that traditional oystering methods can't reach — waters too deep for tongers and too shallow for the dredge boats that work the deeper, off-shore waters. One waterman claimed that divers select the best shellfish and leave the "junk" for the tongers.

The major complaint from tongers was an accusation that some divers are breaking the law by using square wire baskets and hydraulic winches to form dredges that they drag across the bottom. Tongers say that marine police cannot see what is going on below the waterline, yet they can easily monitor the tongers and the deep-water sailing dredgers. Another grievance against divers involves the international divers flag (the blue and white Alpha flag) which might as well be the Jolly Roger, the way some tongers flout it. Many tongers frown upon the flag's safety code, which calls for a leeway of 150 feet.

Protesting the fact that a divers flag can keep a tonger away from a good oyster bar, Robert Haddaway said, "We can have 20 tongers on a spot that three or four divers take up and I don't think this is constitutional. Can divers claim a

territory in the state of Maryland?!"

Divers quickly pointed out that they are prohibited by state law from coming within 500 feet of a tonging boat already at work. This led to accusations by tongers that divers were working before sunrise, which is illegal.

The divers held their own in the fervent squabble, claiming that these were accusations without proof. They also alluded to the underlying jealousy that emanates from the tongers who simply refuse to accept "the new boys on the block."

Mark Radcliffe of Kent Island, president of the Divers Association of Maryland, said, "We don't have a problem. Everybody else has a problem. We're fully licensed and doing our job, trying to make a dollar the best way we know how. In modern times things change and they often change for the best. There are a lot of people who don't want the

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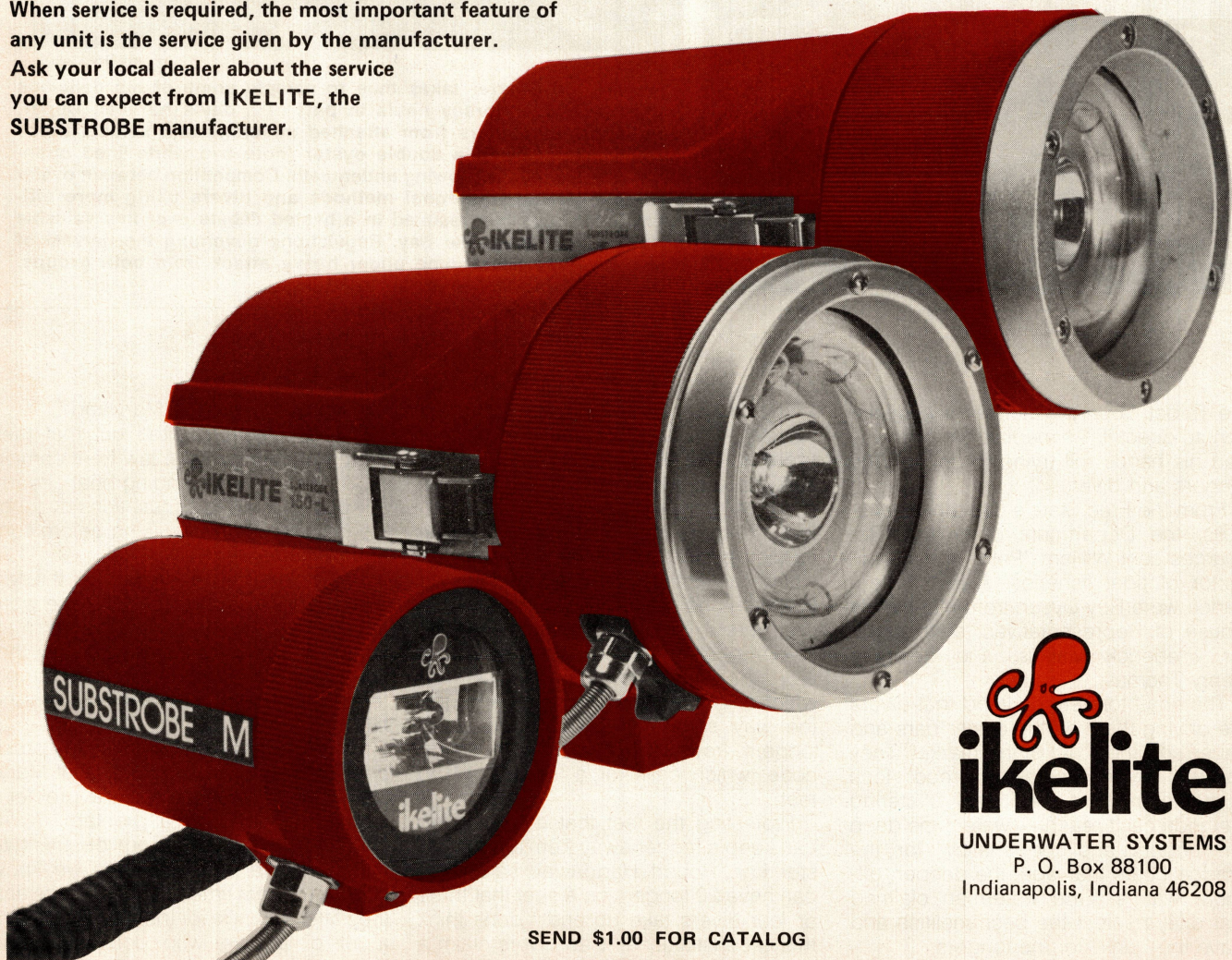
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Harry Ingram uses the traditional tongs to harvest oysters. The tongs are used like giant pincers to probe the bottom for clusters of these valuable animals. Maryland's Chesapeake Bay is an important fishing ground, famous for crabs as well as oysters.

photo/Ellsworth Boyd

changes and they create disputes in an attempt to thwart progress. Heck, we have some members in our association who were tongers at one time, but they see a better way of working the beds now, through diving."

Greg Wilson, 27, of Talbot County, is one of these. "In my family we've been tonging all our lives," he said, "but now we've discovered a better way of harvesting oysters. It's as simple as that. My family and the generations to come may still be watermen, and their goal will be the same — to gather oysters in the fastest, most efficient way possible, while preserving the bay's bottom for the future."

Mike Gordon, 34, of Kent Island, tonged oysters for his father and grandfather. "I tried diving in an attempt to better myself," he said, "and I was successful. My father, who passed away recently, kept an open mind and worked with me. I dove for the oysters and he culled them, and the change benefited both of us and our families."

"Some divers," Gordon added, "have been so successful that local boat captains have given up tonging, taking on divers as partners. While the diver works below, the boat owner culls the catch, tends the diver, and in the end shares the two-man quota of 50 bushels a day. On the other side of the coin, many fathers have nearly disowned their sons, who abandoned tonging for diving. It's an incredible turnabout that may take many more years to be accepted."

Speaking for the tongers, Ricky Roe of St. Michaels asked that the divers be assigned to specific areas and be re-

stricted from working certain parts of the bay. Divers were quick to object, alleging discrimination. Jack Koeneman, of Bozman, countered by saying, "Tongers and divers both have the right to work anywhere they want, as long as there are no bans in the area such as pollution closings or clam bed restrictions." He concluded that as far as the divers getting their points across to tongers, it is a case of the whale trying to tell the elephant what the bottom of the sea is like!

Tidal Fisheries director, Pete Jensen, said that he couldn't see making any immediate changes in oyster diving. "The tongers," he said, "have not proven that the divers are a threat to the bay's oysters or that they are doing anything illegal. Of course I will investigate the charges that the square wire baskets are being used to dredge oysters. But concerning boundaries, to create areas that separate diving waters from tonging waters would require legislation that will be extremely difficult to pass. I doubt that it will ever happen."

Proposals that evolved from the St. Michaels meeting are presently being reviewed by the Maryland Department of Natural Resources. One, the 150 foot distance ruling, may be reduced to 50 feet. Divers have no objection to this. They say it isn't being followed anyway. But they do object to a rule that would limit the cable from the boat to the basket to 50 feet. Presently, they are using 100 foot lengths that give them more freedom of movement underwater and allow them to go deeper. A compromise on this proposal might allow 100 feet for

a round wire basket and 50 feet for a square one. The shorter cable would eliminate the possibility of dredging, since the diver would be forced to work closer to the boat. Those who want to work farther from the boat would use the 100 foot cable and round basket because it would be very difficult to illegally dredge the bottom with a round container. There is really no evidence to prove accusations that divers are using power dredging to harvest oysters, nevertheless, divers seem willing to accept the short cable, round basket legislation in order to silence the tongers.

Tempers are running particularly high over the diver-tonger issue because of the disappointing crab harvest last season. Most crabbers say they made a bare living at best. Many crabbers become tongers during the oyster season, from mid-September to mid-April. Now, they are fearful of a mediocre oyster harvest, similar to their crab catch. Their fears heighten when they see divers bringing in large catches of big oysters, ones that are more in demand and bring higher prices.

Tongers are quick to point out that some of the divers are not locals, but people from outside the watering counties, or the state, who come to the eastern shore for the season's work and leave, taking their earnings with them.

The average Chesapeake Bay oyster diver is 18 to 35 years old, married and lives year-round on the eastern shore of Maryland. Usually he has a partner who owns and operates the boat. (In some instances they are joint owners.) He works six days a week, ten hours a day, seven

months a year.

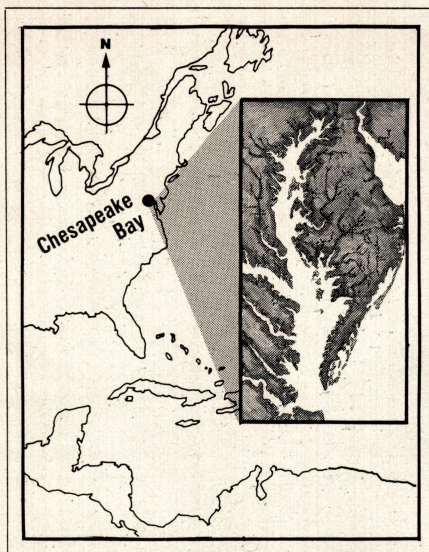
The diver averages 100 dollars a day when he works, but must cease operations during snow, ice, storms and severe winds. The oyster season begins September 15 and ends April 15. In the beginning, quarter-inch wetsuits are fine, but drysuits are necessary when winter sets in. The diver uses scuba to locate the beds and surface air to gather his catch. Visibility is one to three feet, unless he stirs the bottom up — then it's zero. The average depth is 20 feet. It might take 20 minutes or two hours to reach the oyster beds, depending on the boat's home port. The boat leaves before dawn and the diver works the beds until about 2:00 pm. It might take an hour to return, another hour to sell the catch at the packing house, and still another hour to clean the boat and stow the gear. Some divers say that ten hours is one of their easier days.

A diver who averages \$10,000 for the seven month season considers himself fortunate. In most cases, this is gross pay — expenses still must be deducted. Most divers spend the remaining five months crabbing, fishing or clamming, where ten hour days are still in vogue. But as John Volatile says, "At least I don't have to jump into 40°F water!"

Jensen says the number of divers has increased considerably since 1976, when there were five or six full-time divers on the bay. Last year, according to Department of Natural Resources figures, there were 80 divers working the Maryland waters of the Chesapeake, and 1000 hand tongers. Divers were credited with catching eight percent of the oyster harvest, but their market price was about ten percent higher than the tongers because of the many counts they selectively gathered. Counts are the very best, extra large oysters, selects are medium-size, and standards are the smaller ones. At dockside, a bushel of oysters brings anywhere from \$5 to \$10, depending on the size.

Jensen speculated on why oyster diving has suddenly become popular in Chesapeake Bay. "The method appeals to young people for one thing," he says. "Also, when the economy is poor and jobs are hard to get, more young people turn to crabbing, fishing and oystering for a living. There is improved equipment and modern techniques now, advantages divers didn't have when they began in 1976."

Pioneer oyster diver, Joe Dorsey, owner of Baltimore's Diver's Den Sports Shop, verified Jensen's appraisal of equipment and methods. "Heck," Dorsey says, "we didn't have surface air when I started diving for oysters in 1976. We used scuba tanks. There were no complaints about dredging the bottom with hydraulic lifts because we didn't



have any. The tender pulled everything in by hand. For a long time it was hit or miss — sometimes we would find oyster bars and sometimes we wouldn't. Now, the divers have modern boats, compressors and hydraulic winches. Some of the divers are sons of watermen and they can locate the best oyster bars in their sleep! That's the key to becoming a successful oyster diver. In the beginning, we used to cruise around for hours before we discovered decent oyster grounds. It's incredible, what's happening today between the divers and tongers."

"But you know," Dorsey continues, "we never had a lick of trouble with the tongers. But there were only a half-dozen oyster divers on the whole bay then. I remember when the tongers used to look at us as if we were side-show freaks. They couldn't believe that anybody could be crazy enough to jump overboard and search for oysters! I had a good relationship with the tongers. Sometimes I untangled lines caught in their props, inspected their hulls and kibitzed with them when we were anchored near each other."

"Things have changed now," Dorsey observes, "and the tongers' livelihood is being threatened by increasing numbers of divers. But I think the numbers are settling in now, because for every diver who tries it and stays, ten will quit. It's a tough way to make a living and fraught with hardships. Cold winds sweep across the bay in winter and turn your skin blue. Sometimes wind resistance is so bad you can't keep your boat in place. Sometimes the fog is so thick you can't see the bow from the stern. We were iced in once for three weeks. A commercial fishing boat that ventured out during that same freeze went down and lost its captain and four crewmen. I dove for oysters for nearly three years and believe me, I don't miss any of those hardships."

"But do you know what I miss the most

about oystering? I miss cracking them babies open only minutes after they left their beds. I ate 'em in stew in the morning, from the half-shell at lunch, and in fritters for dinner. Soft, satin-smooth and shaped like a teardrop, the Chesapeake Bay oyster is the world's best because it is a freshwater shellfish with just a touch of tangy saltiness."

"I hope the tongers and divers can settle their dispute and preserve a delicacy that is part of Maryland's heritage," Dorsey concluded. "Chesapeake Bay oysters are part of everybody's heritage. Heck, I think the Indians dove for them long before the white man arrived in this country!"

The Indians did indeed dive for oysters. Tribes such as the Nanticoke, Wicomico, Chesapeake and Potomac — names presently used for counties, rivers and the bay itself — were well acquainted with oysters and valued them highly. When Captain John Smith explored the Chesapeake in the 17th century, he watched the Nanticoke warriors rake up large piles of fresh oysters from creek bottoms, using long-handled forked sticks. When a stick failed to dislodge a cluster of the succulent bivalves, a stout-hearted brave dove in, broke it loose bare-handed, and surfaced with his prize.

Captain Smith and his men called the Indians "baymen" and wrote about Nanticoke village oyster feasts that sometimes lasted several days. Mounds of shells still remain, memorials to the baymen and their shellfish banquets. Historians have located many Indian villages and encampments from discoveries of layers of shells just below the topsoil. Nathaniel Kenney, Maryland writer, historian, and former waterman, says, "At Gibson Island, near the mouth of the Magothy River, I discovered a shell stratum six feet thick. Left by early American Indian tribes, some of the shells bear smudges from the fires that were used to steam them open. I am amazed by the frequent discoveries of these lofty mounds of shells, evidence of the bountiful supply of oysters that existed in the early days."

But the bountiful supply faces still another threat — power dredging — that the Department of Natural Resources is presently studying. Maryland law allows dredging by sailboat only, which cuts down the quantity of oysters harvested and keeps the bottoms from being scraped clean.

Sometime in the future, if the dredging issue mushrooms into a political football, it might unite the tongers with the divers, banding them together against the dredgers! What do officials of the Department of Natural Resources say about this? They shake their heads in disbelief and murmur: "Now that's incredible!"

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CHUCK NICKLIN

(Continued from Page 29)

cameras in their hands?

CHUCK: No, not really. In fact, I leaned over backwards to make sure I didn't suck Flip into the family business and it nearly backfired. When he got out of college he came to me and said that he was going up the coast and work for Al Santmeyer. I said, "What do you mean?" He said, "Well, you don't want me in the diving business so I'm going to go where they do." I said, "Wait a minute!" I'd been leaning over backward so far that he thought I didn't want him. He jumped into the dive business for awhile and then he decided that he was going to go into underwater photography.

SDM: How about Terry?

CHUCK: Terry works like mad and is really into the dive business. He feels that ten years from now he'll have the staff and he will do something like turn it over to somebody else.

SDM: Do you see feature films including much more underwater themes in the future?

CHUCK: What's happening now is that a lot of things can be done so that the underwater element can be used a lot more. It used to be that if someone fell in the water they'd shoot it from topside but

not underwater. Now they accept those shots as part of the film — it's just another angle. The underwater phase of drama is becoming more accepted by Hollywood, the networks, and so forth, and we'll see much more of it because of that.

SDM: You obviously love your work. . .

CHUCK: I'm an independent person in that I can get away when the work comes up. I appreciate the time at home and sometimes the work means being in places that aren't always as much fun as they sound. Being in the Bahamas for



Chuck films a scene from *For Your Eyes Only*.

photo/Walt Clayton, Ocean Films Ltd.

four months may sound glamorous but it's a lot of hard work. That's what a lot of people don't appreciate. They don't see that you've had to decompress for an hour when it's getting dark and you're freezing, and they don't see a lot of the things that are really tough on a person.

SDM: What is your next project?

CHUCK: I'm going to shoot a whale film. This will be the seventh year in a row that I've worked with humpbacks in Hawaii.

There is a secret to filming whales, or anything in the ocean, really, and that's don't disturb them. I'm very conscious of the whales. Even if it jeopardizes what I'm trying to do, I won't disturb them. People want you to document whale behavior, but if you're bothering them you haven't got true behavior, you have reaction. It takes a lot of time, patience and caution.

SDM: When budding photographers ask you for advice or tips, what do you tell them?

CHUCK: You have to sacrifice your security for it. Perhaps you can do it as a part time thing and eventually break in, but when someone says they have a little shoot, can the person do it, and he has a 9-5 job, they'll get someone else. You're better off if you have flexibility. Also, the more you shoot, the better photographer you're going to be. I have learned from everyone I get close to, especially Al (Giddings). I shoot every chance I get and I'm learning every day.

SDM: Do you ever think back on the grocery business and wonder what life would have been like if you'd stayed there?

CHUCK: Every now and then I go by that store — it's still Chuck's Market — and I find it hard to believe. But, you know, if I had stayed in the grocery business that store would be a supermarket or I'd have a chain, or something. I like people and I like challenges and my life seems to be full of both. >>>

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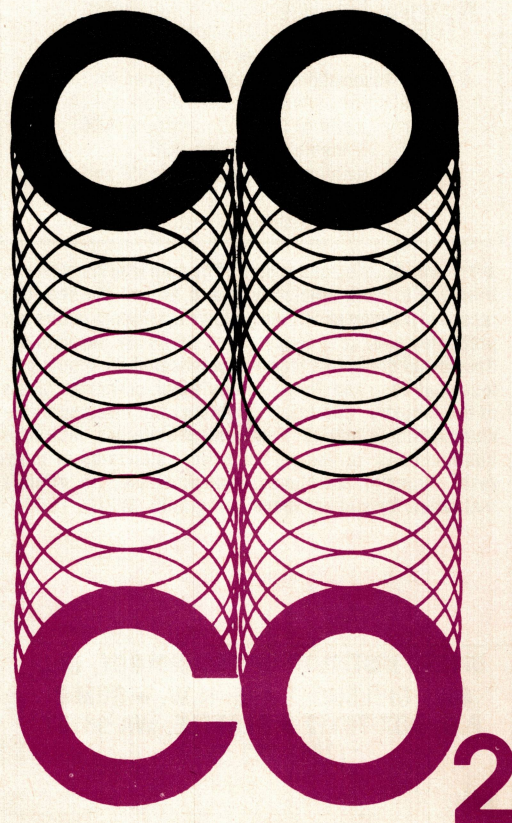
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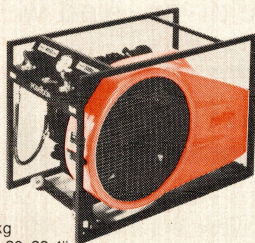
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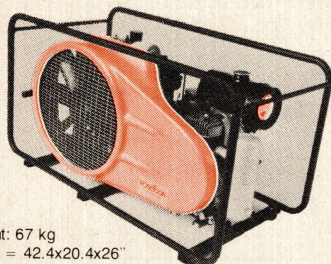
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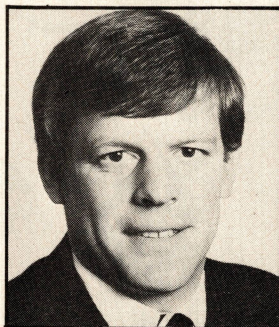
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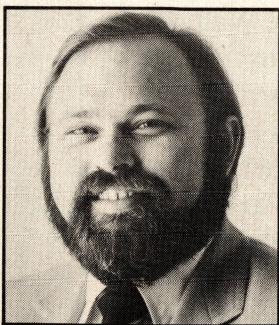
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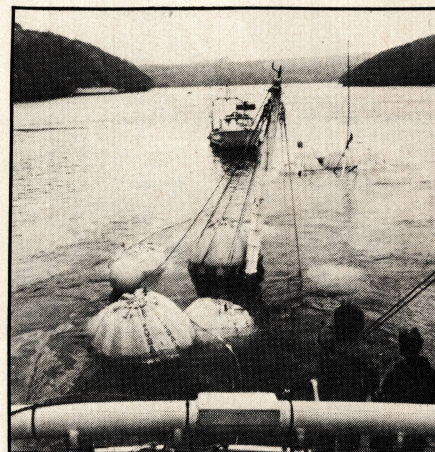
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For further information contact: J. W. Automarine, One North Broadway, Suite 620, White Plains, NY 10601, phone (914) 682-8164; or J. W. Automarine, 5065 Pacifica Drive, San Diego, CA 92109, phone (714) 273-6760.

MASTER INSTRUCTOR

Bob Tseng is the owner of the Westchester Dive Center, a PADI 5 Star Training Facility in Port Chester, New York. His



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The education you will receive at PDSNY is the result of work begun 30 years ago, and which continues today by a recognized expert in deep diving and submarine technology. Andre Galerne, founder and president of IUC, began his work in France as a diver in World War II, later joining Jacques Cousteau aboard the Calypso, there to begin his career of developing safe and innovative diving and submersible techniques.

IUC, which includes Mr. Cousteau among its board members, has become an international leader in underwater industry. It was the first to develop and utilize tri-gas breathing mixtures, and the first to compress divers deeper than 1,000 feet. Galerne's newest innovation, a hyperbaric diver transfer system, is being utilized in the North Sea. IUC developed the North Sea Hyperbaric Center in Aberdeen, Scotland. It is the only hyperbaric facility specifically designed for diver transfer, under continuous pressure, in an emergency medical or evacuation situation.

The submersibles Techdiver, Beaver Mark IV, Mermaid II, Pisces VI, Mantis X and Mantis XI, in IUC's fleet, are capable of working at depths to 1.5 miles—beyond the capabilities of divers. However, trained divers are required to operate the submersibles.

To ensure the availability of professionally and properly trained divers, IUC established PDSNY. It was obvious that we would have to make significant changes in traditional diver training techniques if we were to find, train, and hire the kind of diver that IUC and the industry needed. The school is staffed by IUC's own diving supervisors under the direct management of IUC's training and safety department. You will be taught the highest standards of the industry by field qualified instructors.

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PDSNY and IUC's world headquarters are located on the same 7.5 acres—at the water's edge on City Island in New York City. This strategic location provides students with much more than routine diver education:

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Over 15,000 square feet of classrooms, diving tanks, shops and floating barges comprise the school's facilities.

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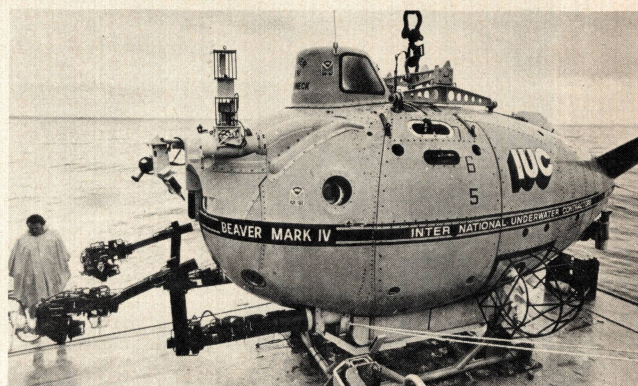
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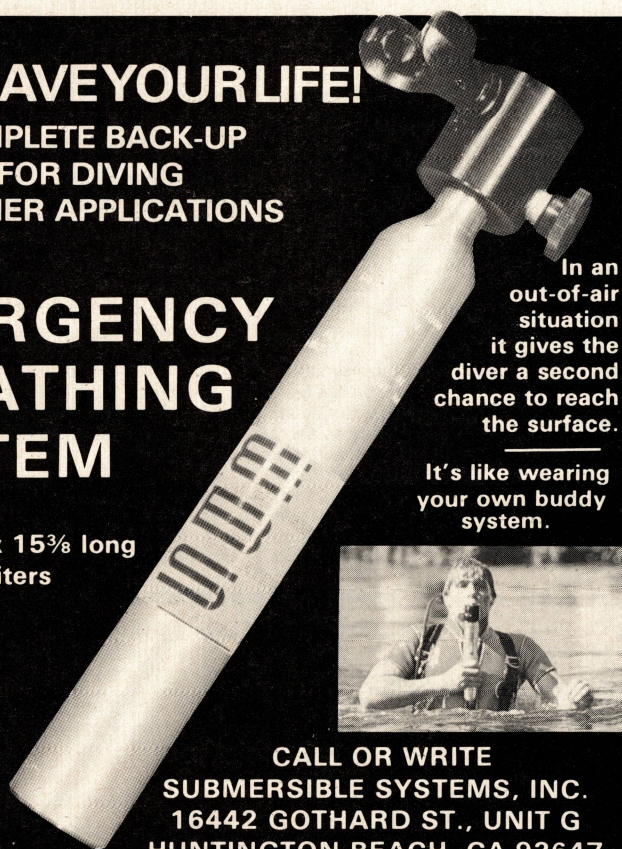
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PADI MATERIALS

The new, revised version of the popular Look Into Diving brochure is now available from PADI. This brochure adds a professional touch to course promotion. Thirteen colorful photographs and text make this an effective tool for program promotion. Ample space is provided for local contact information and allows personalization of the brochure.

A new Look Into Diving counter display is also available for displaying these brochures. Designed to complement the revised brochure, it will hold about 25 of them.

To order these promotional materials, contact PADI Headquarters, 1243 East Warner Ave., Santa Ana, CA 92705.

YMCA INSTRUCTOR CERTIFICATION

YMCA Instructor Certification Institute will be offered at the John Pennekamp Coral Reef State Park in Key Largo, Florida Saturday, May 1 through Thursday, May 6.

Pre-institute, for those needing practice teaching and the fulfilling of other pre-requisites for the institute, is Monday, April 26 through Friday, April 30.

Write or call institute directors: Al Marques, director, Underwater Activities Program, Coral Reef Park Co., Inc., P.O. Box 13-M, Key Largo, FL 33037, phones: (305) 451-1621; Miami line 248-4300; Florida toll free line, (800) 432-2871 — or Paul Caputo, director, Quiescence Diving Service, P.O. Box N-13, Key Largo, FL 33037; phone (305) 451-2440.

OYSTER LARVAE STUDY

Oyster growers — and hence the oyster-eating public — could well be affected by some little-heralded research taking place at laboratories on the University of Washington campus and at the University of British Columbia. Rose Ann Cattolico, an associate professor in the department of botany at UW, and Raymond Andersen, a marine natural products chemist at UBC, are engaged in a project funded by Washington Sea Grant to study a tiny organism that, in the words of Cattolico, "could have potentially disastrous effects on fishing and shellfish industries."

The organism, known as *Olithodiscus luteus*, has been recognized as one of the species of algae associated with "red tides" throughout the world. It has also been identified in algal blooms (red tides) in lower New York Bay on the East Coast as well as in certain areas of Japan.

Cattolico and Andersen are interested in *Olithodiscus* because their preliminary findings indicate that it affects the

survival of oyster larvae. They believe that algal blooms of *Olithodiscus* could present serious problems to oyster culture both in the United States and in other countries as well. "Unfortunately," says Cattolico, "little is known about either the chemical nature of this organism or its field ecology and morphology."

Cattolico and her assistants, Kathleen Welling and Leslie Williams, are growing *Olithodiscus luteus* in the laboratory in an artificial seawater medium and are studying the effects of temperature, nitrogen and phosphorous levels on its growth. They have discovered that if *Olithodiscus* becomes stressed by slight changes in temperature, for example, it secretes organic substances which are not yet identified. These substances appear to act as growth substrates for bacteria which have been associated with oyster larval death.

Cattolico and her coworkers also hope to identify physiological conditions that cause increases in the population density of *Olithodiscus* and thereby predict when and where these algal blooms are likely to occur. "This information," says Cattolico, "might facilitate selection of environmental sites for oyster culture that minimize bloom potential and thus permit completion of normal oyster development." ❧

NAUI UNDERWATER '82

April 3 is the date for Underwater '82. An annual event, the show is entering its 16th year. Starting at 12 noon and continuing through to 6:00 pm the Underwater Symposium will unfold at Harvard University's new Science Center. Featured speakers will be John Hughes of the Massachusetts Lobster Hatchery, Steve Allen of Draper Labs, Peter Throckmorton, David Clancy of the Bay State Council of Divers, Dr. Donald Butterfield, Lou Fead of UNEXSO, John Burrage, Kent Mack, Tracy Tibedo, Barbara Bates, Art Cohn of Northern Divers, and more.

The lobby area of the Science Center will have displays highlighting wreck diving artifacts, dive boat charters, club information; dive travel destinations, and others. The Underwater Symposium is being coordinated by Peter Hamer.

At 8:00 pm in John Hancock Hall in Boston, MA, Fred Calhoun will present the Underwater Film Review, with MC, John Burrage. Stan Waterman will present his latest film. Stan is one of the world's acknowledged master in-water cinematographers.

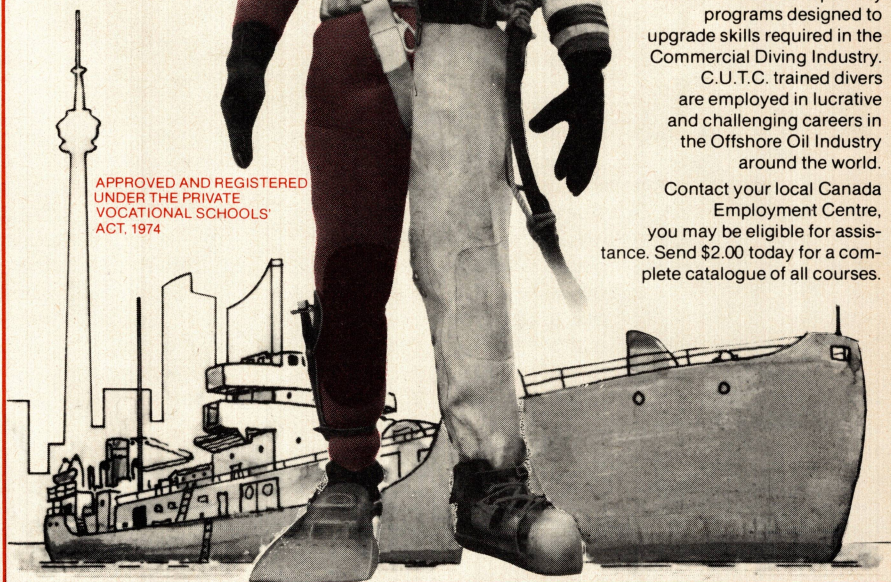
Tickets are \$5 for the Underwater Symposium and \$5 for the Underwater Film Review and may be purchased at the door on the day of the performance or by writing to Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston MA 02117. Make checks payable to NAUI. ❧

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Technifacts

BY E.R. CROSS



Technifacts readers, particularly prospective students of commercial diving schools, frequently ask about the kind of work a commercial diver performs and the kinds of equipment and tools used. To acquaint readers with commercial diving, Technifacts will visit jobs from time to time and review the personnel, equipment, tools and techniques required. Other questions asked are, "Where do divers work?" and closely related, "Where do dive jobs occur?" Technifacts' visits to job sites should help answer these questions as well.

Dive jobs can and do occur wherever there is water. This month Technifacts visited a job in the heart of the wheat country, in the state of Washington.

PROJECT

The name of the project is the Lyons Ferry, Washington, Fish Hatchery Water Supply System. It is part of the Lower Snake River Fish and Wildlife Compensation Plan. The job site is the Palouse River just upstream of the confluence of the Palouse with the Snake River, near Starbuck, WA. To get acceptable water, deep wells were drilled and this water piped to the fish hatchery through nearly 10,000 feet of 60 inch diameter pipe, about 7000 feet of which had to be laid underwater along the bottom of the Palouse River.

The design of the underwater part of the water delivery system called for the 60 inch pipe to be laid on, and bolted to, prefabricated combination pile cap-pipe

saddles which were bolted to deeply driven steel pilings spaced every 64 feet. The entire project is under the supervision of the U.S. Army Engineer District, Walla Walla. Plans, drawings, engineering and supervision of the project is by representatives of that office. Some phases of this job are still in progress. However, the underwater work was completed in November, 1981.

CONTRACTOR

The contractor for the underwater pipeline system was Coast Marine Construction of Portland, Oregon. This company was required to provide all equipment and certain designated material needed to place the pipeline system in position, ready to supply water to the

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hatchery. The equipment included work and supply barges, tugs and launches to transport workers from shore to the job site. Also the contractor was to provide all divers and dive equipment. The latter was subcontracted to a company specializing in underwater pipeline construction.

DIVE SUBCONTRACTOR

U.S. Army Engineers specified certain strict dive requirements (basically the same as those of OSHA) intended to make diving as safe as possible. The required four man crew was composed of a diver, a stand-by diver, a tender and a stand-by tender (who also doubled as a telephone talker). The diver was required to wear equipment that permitted voice communication. The emergency stand-by diver could wear scuba under the conditions present at the job site. Owing to the remoteness of the job site from support facilities, the possibility of lengthy diving, and because the area is somewhat above sea level, a recompression chamber was required at the site.

American Divers, Inc., of Honolulu, Hawaii, specialists in underwater pipeline work, submitted the lowest acceptable bid for the work. Their lead diver was Larry Harrison from Santa Barbara, CA; stand-by diver, Bob Campbell, from San Francisco; tender David Darlow, of Spokane, Washington; and stand-by tender, Ray Breem, also of Santa Barbara. In addition, Pat Wolter, president of American Divers, was in close touch in an advisory capacity.

DIVE EQUIPMENT

All diving in the construction phase had to be with equipment that permitted voice communication between the diver and topside personnel. To meet these requirements and to give support in the event of equipment malfunction, one complete set of helmet equipment and one complete set of bandmask gear were on the job. Helmet equipment was preferred by the divers for most heavy work, such as cutting off pilings, and for all work in very cold water. The bandmask outfit with voice communication was mostly used for placing and bolting piling caps and pipe saddles and for lining up and placing the pipes. A complete scuba outfit with spare regulators and tanks was on stand-by for an emergency. An air compressor suitable for helmet work to required depth, air hoses, telephone, cables and necessary valves and fittings also had to be on the job. Spare parts for helmet gear, bandmask outfit, and scuba were also on hand. The recompression chamber was a 54 inch diameter, two-lock chamber with internal and external controls, air supply, air hoses, telephone system, gauges and necessary equipment for giving either surface decompression or treating any dive accident that might occur.

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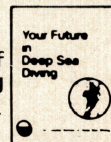


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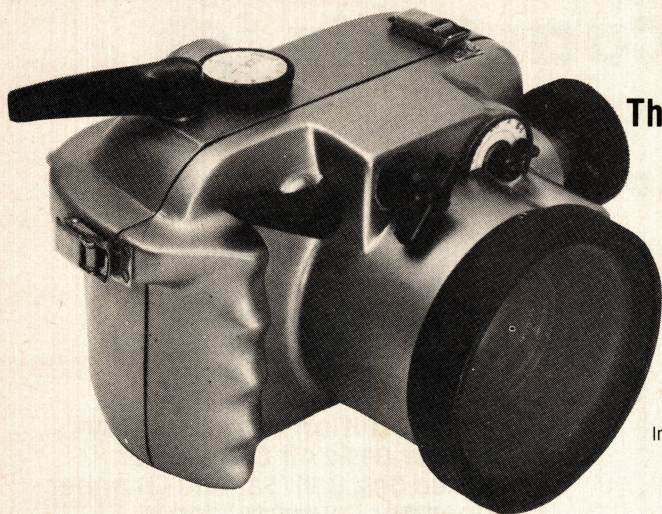
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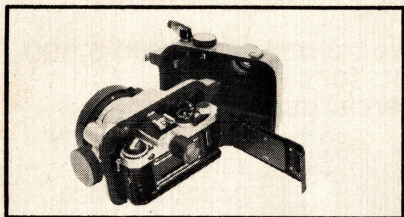
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TECHNIFACTS

THE DIVER'S TOOLS

The principle diver operated tools on the fish hatchery job were underwater oxy-arc metal cutting equipment and a compressed air-driven impact wrench for tightening or loosening bolts. Small lift bags on the heavy tools, such as the impact wrenches, made the diver's job easier. In addition, maintenance tools for all diving and related equipment had to be on the job site.

DEFINITIONS

Before going further it seems advisable to define a few words that may not be familiar to some readers.

Pile Bent: Two steel bearing piles with a combination pile cap-pipe saddle forming a support for one end of the 60 inch diameter pipe. Each pipe length is 64 feet and bents are therefore 64 feet apart. Bents were numbered with the in-shore sets of pilings being bent #1 and with the progressively higher numbers downstream.

Pile Cap: A prefabricated steel assembly bolted around the steel pilings to ensure that they act as a unit to support the weight of the pipes.

Saddle: A support of preformed steel shaped to fit the contours of the pipe to keep it from moving during installation and use. The pipe is held in place by a large clamp that passes over the top of it and is bolted to the saddle.

DIVER'S LOG: SEPT. 10, 1981

"Diver cut off tops of steel pilings at bent #50. Diver assisted with taking grade readings then secured saddles to east and west pilings and cut off tops of piles at bents #49, 48, 47, 46, 45 and 44. Diver assisted with taking grade readings and secured saddle to east and west piles. Tops are left on these piles. Oxy-electric cutting rod burned, 93." The diver made a total of eight dives leaving the surface for the first dive at 0730 and surfacing from the last dive at 1508. Depth of water 15 feet. Total bottom time, 258 minutes. Equipment used, helmet gear.

THE DIVER'S WORK

Based on a study of the project plans and an inspection of the job site, it appears to Technifacts that there was some pre-contract and pre-construction diving work. This probably included a survey of the river bed along the pipe route and recovery of river bottom samples by use of a diver-operated bottom sampler. Pre-construction work such as this would be by divers contracted for directly by the U.S. Army Engineers.

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ers was to assist in getting pilings driven on station and to grade, to bolt the pre-fabricated combination pile cap-pipe saddle in place, to cut off the steel piling tops, to place the large diameter pipe sections and to install hold down clamps over them. Other incidental underwater work involved placing bedding material to stabilize the pipe and to inspect back-fill material at both shore ends.

Some specifics of work done by the divers follows: During placement of the combination pile cap-pipe saddles, the crane lifted the assembly and placed the two ends over the tops of the two pilings. The assembly was then lowered to just above the water. When the diver was ready to descend, the assembly was lowered approximately to grade. The diver then descended to the assembly and held the end of a marked gauge on a pile cap. A grade man in a boat on the surface read the gauge and directed the crane operator to raise or lower the assembly until both ends were at the proper grade.

The diver then surfaced for the 40 pound, compressed air driven impact wrench and, with the aid of a small float bag to give neutral buoyancy, descended to the pile cap-pipe saddle assembly. With the impact wrench the diver then tightened the nuts on the bolts. When this was completed the diver disconnected the slings and took the impact wrench to the surface where it was lifted out of the water by the tender or stand-by diver. Dive equipment with a communication system is required for this work and a telephone equipped bandmask unit was in use when Technifacts visited the site.

The arc-oxygen method of underwater metal cutting was used by the divers. The ground lead was taken to a ground position below the point of cut and connected. Topside the tender and stand-by diver connected the switch and then connected the cutting torch to oxygen bottles and the electric lead. The welding machine was started, oxygen cylinders opened and pressure checked and adjusted. Then the cutting torch was lowered to the diver. He opened the oxygen valve, struck the arc at the prescribed cut-off point and cut off the steel pile.

In addition to the actual construction dives there are always numerous small dive jobs on any underwater project. These will include recovery of items dropped overboard, reconnecting parted anchor cables or chains, locating lost anchors and innumerable inspections to satisfy engineers and inspectors that all is as it should be.

DIVER'S LOG: SEPT. 18, 1981

"Diver laid pipe section #61. Diver had to re-rig a sling on the inshore end of section #62 to close up west gap. Made approved joint (1135). Diver secured tie rods. Diver secured U-bolts at bents #1

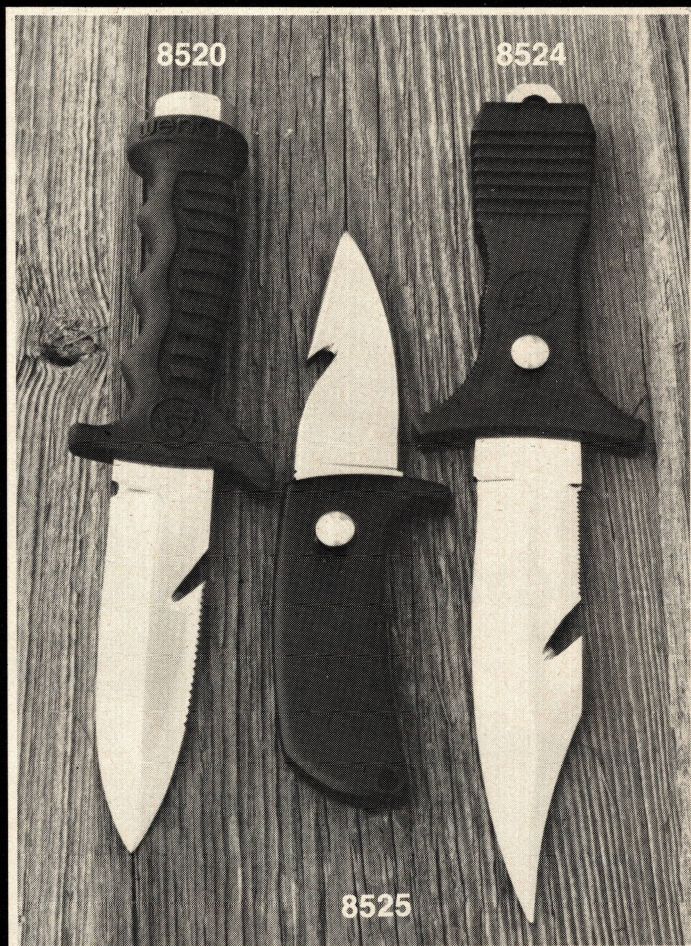
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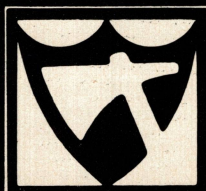
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TECHNIFACTS

and 1-A. Diver laid pipe section #63. Diver made approved joint (1559) and secured tie rods. Diver placed sand bags at the inshore end of section #63 on east and west sides to stabilize pipe. Diver removed lifting slings from pipe." The diver made a total of three dives leaving the surface for the first time at 0742 and surfacing from the last dive at 1621. Depth 15 feet. Total bottom time, 435 minutes.

Seven hours and 15 minutes underwater. A long day.

Technifacts for next month will be another fun type commercial diving enterprise: bottle collecting, cleaning and selling. This activity has excellent specialty potential for dive shops and charter operations. 

PDSNY TOUR

Candidates in Bob Eriksen's 1981 New York City scuba instructor course recently visited the Professional Diving School of New York, the Commercial Diver Training Division of International Underwater Contractors, Inc. They performed boat dives from the PDSNY 45 foot work boat and beach dives in an area of Long Island Sound near the City Island, New

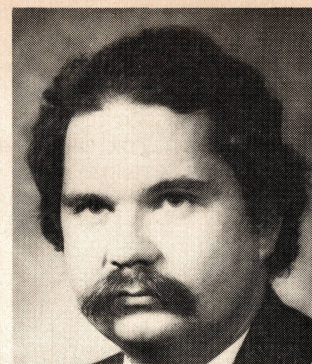
York facility in the morning. In the afternoon, the group were treated to a tour of the IUC/PDSNY facility by the school's training director, Gary Parsons. They were shown saturation systems, deck decompression chambers, submersibles and other examples of IUC's operations.

IUC matches the PDSNY student tuition in order to produce qualified divers and in the past has hired 74 percent of the school's graduates and placed them in their worldwide operations.

The day provided the candidates with an opportunity to experience advanced equipment they had read about but had never seen. 

DIVERS UNLIMITED CAREER CENTER

Divers Unlimited is opening a complete, professional career training center at its new, ultra-modern facility in Ft. Lauderdale. The new organization, Underwater Careers International, will be devoted exclusively to training personnel for the expanding sport diving industry. Programs at UCI will include monthly PADI Instructor Training Courses, retail dive store operations and advanced management courses, and a unique program designed to train qualified resort divemaster/specialists. In addition, a complete range of PADI specialty courses will be offered on a continuing basis.



UCI program director is Alex Brylske. A PADI master instructor and ITC course director, Brylske has a considerable background within the sport diving industry. For the past two years he has served on the executive committee and national headquarters staff at PADI. While in the position of projects manager for the PADI training facility program he worked closely with diving retailers, and developed numerous programs involving both the business and instructional aspects of diving.

Career counseling and placement assistance will be given to all graduates of the resort specialist or dive store operations programs. Complete information on UCI and its programs may be obtained by contacting Underwater Career International, 6023 Hollywood Blvd., Ft. Lauderdale/Hollywood, FL 33034; (305) 963-5255. 

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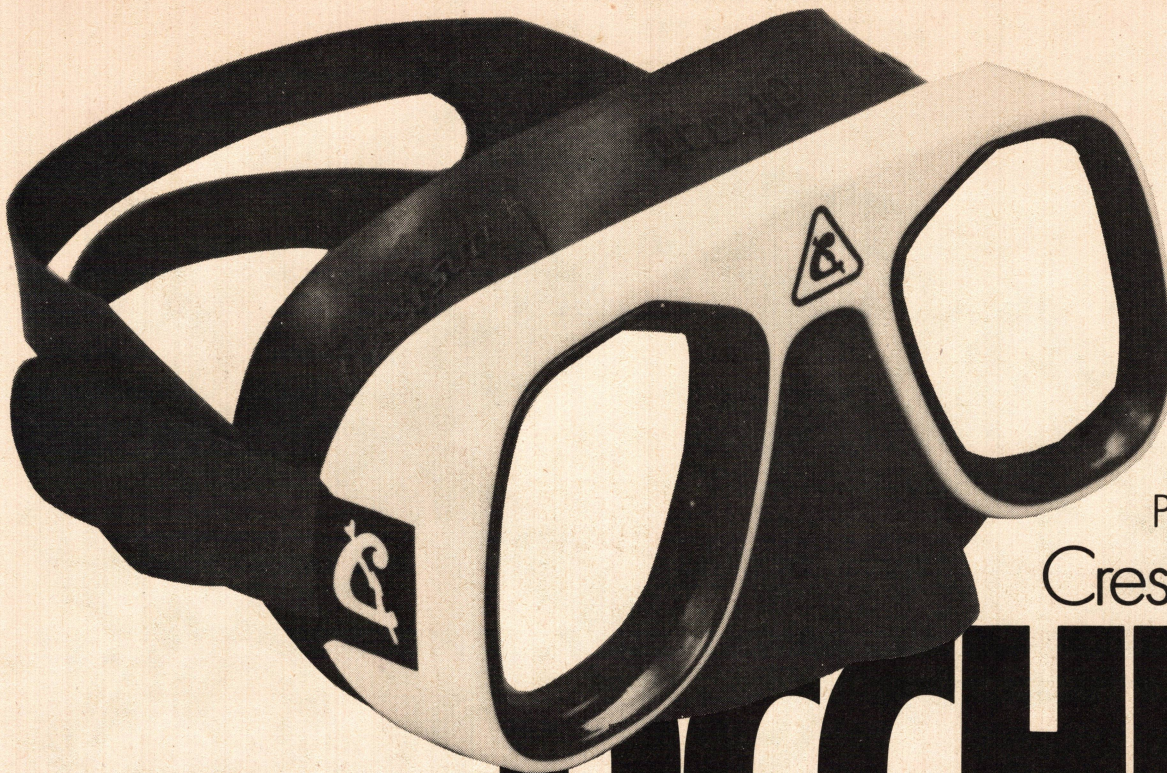
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For A Low
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Cressi-Sub's

OCCCHIO

BY BONNIE J. CARDONE

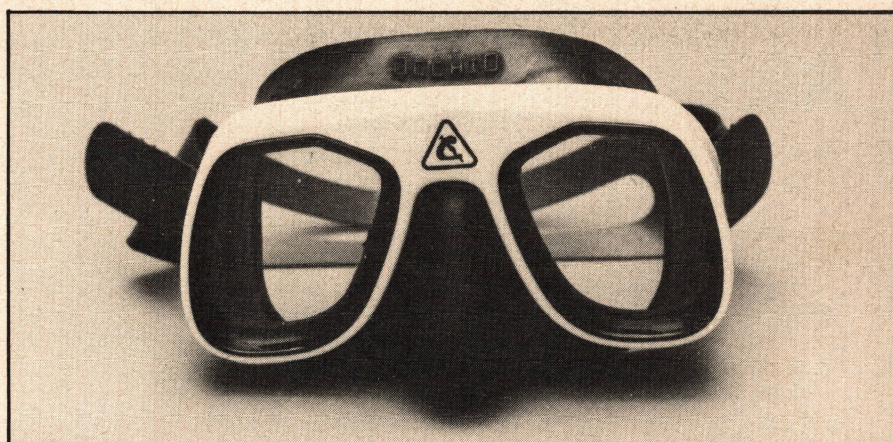
Small and lightweight, Cressi-sub's Occhio mask looks like a toy until you pick it up. Then you notice the sturdy yellow frame, the tempered glass lenses and the soft rubber skirt. Less than six inches wide and four inches in height, the Occhio was designed with three types of water-lovers in mind: Those with small faces; those who free dive; and those with mustaches. That's not to say that if you don't fit into one of these groups you won't be able to wear it — it's just that these three types of people will appreciate its special features more.

The Occhio is Cressi's lowest volume mask and probably the smallest face-mask on the market. It's just a step away from goggles. A low volume, low profile mask, it is easy to clear and creates very little drag. Because it fits so close to the face, it also allows its wearer good vision. These particular features make it very popular with free divers and snorkelers.

The mustachioed diver will love the Occhio's fit and watertight seal. This is because the soft rubber skirt curves slightly upward under the nose pocket, allowing room for those hairy upper lips.

Because it is so compact, the Occhio is perfect for those with small faces. Even a child can wear this mask comfortably. It won't overlap the hairline on the side so it seals well.

The Occhio's two tempered glass lenses are surrounded by a soft rubber, double-flanged skirt and set into a one-piece frame of ABS plastic. This mate-



The Cressi-sub Occhio is a small, low volume, twin-lens mask. It is perfect for divers with small faces and those who free dive. The soft rubber skirt curves slightly upward under the nose pocket to allow room for a diver's mustache.

PPC staff photos/Jim Brown

rial is extremely durable and scratch resistant. In June, Cressi expects to have the Occhio available in hypoallergenic clear silicone.

Three of the Occhio's features have universal appeal: The soft rubber nose pocket that allows easy equalizing; the photogenic, black, orange, blue or yellow frame; and the special strap clips. These latter slide neatly into the sides of the mask so they can't catch on things. Tug sharply on the ends of the strap to release them, adjust the strap to the

right length and slide them back. They lock in place to ensure that the split head strap cannot slip or come loose.

Care for the Occhio the way you would any mask. Rinse it in fresh water when your dive day is over and allow it to dry. Keep it out of the sun since sunlight tends to dry the rubber.

One of the Occhio's nicest surprises is its price. It sells for just \$27.90 at your nearest Cressi-sub dealer. For more information write: Cressi-sub, 677 S.W. First Street, Miami, FL 33130. 

CYKLON MAXIMUM



CYKLON MAXIMUM

TEXT AND PHOTOGRAPHY BY GEORGE COZENS

Recently introduced into the high performance category of scuba regulators is the Cyklon Maximum, made by Poseidon Industries of Sweden, and distributed in the United States by Parkway Fabricators, Inc. The Maximum joins another high performance regulator from Poseidon, the Cyklon 300. As you might recall, it was one of 36 scuba regulators tested by the U.S. Navy Experimental Diving Unit (NEDU) in 1979. After the bubbles cleared and all of the test data were analyzed the Cyklon 300 was selected as one of seven regulators which met or exceeded the newer, upgraded performance requirements of the NEDU.

To evaluate the performance characteristics of the Cyklon Maximum, Poseidon conducted a wet test in a recompression chamber at its Testing Center in Gotenborg, Sweden, "in accordance with U.S. Navy experimental diving norms." Breathing resistances (inhalation and exhalation) were measured at equivalent depths (in salt water) ranging from the surface down to 300 feet, with a constant supply (tank) pressure of 1000 psi.

The results of this test indicated the

Maximum has very good breathing characteristics. In fact, when compared to the results of five other popular regulators tested by Poseidon and NEDU under similar conditions, the Maximum exhibited lower inhalation and exhalation resistances at most depths, and at all depths greater than 33 feet. Of the five regulators used, three were selected from the high performance group of the 1979 NEDU test (one of these being the Cyklon 300); the remaining two — made by two major manufacturers, are highly regarded and have been widely used for years.

Suppose we take a closer look at the Cyklon Maximum. The rather conventional looking first stage is compact, but heavy. Constructed of brass and plated with brush-finished chrome, it is designed to function with primary (supply) pressures up to 4300 psi. Three different Maximum valve connectors are available for U.S., British and German tank fittings, and all will withstand the maximum 4300 psi pressure. The high pressure inlet filter is a bit unusual: it is cylindrical in shape (rather than flat) to provide greater surface area for filtering.

Internally, the first stage mechanism is

a turbo-assisted balanced diaphragm design — balanced to minimize effects due to changes in cylinder pressure. It is capable of delivering up to 1850 liters of air per minute, as compared to flow rates of 800 liters per minute, typical on first stages of lower performance. One high pressure port and four low pressure ports are provided — all, however, are a $\frac{1}{8}$ inch BSP thread size (this is close to the standard $\frac{3}{8}$ inch 24 thread size used in U.S. regulator low pressure ports). The $\frac{1}{8}$ inch BSP has more threads to the inch, and although a $\frac{3}{8}$ inch-24 fitting may screw into a $\frac{1}{8}$ inch BSP threaded port, the two are not really compatible and the connection may not be strong enough. Instead, an adapter should be used for attaching U.S. fittings to the Maximum's first stage (one is available from Parkway/Poseidon, Cat. #2293).

An anti-freeze cap is available for regulator use in cold water (below 43°F). This cap can be filled with alcohol or a glycol and water mixture, and clamped to the diaphragm end of the first stage housing where a special sealing groove has been provided.

The second stage of the Cyklon Maximum is exotic looking. The case, made of

black, high-impact resistant ABS plastic, has a long, low profile. The exhaust valve is located at the end — so exhaust bubbles exit and rise at the side of the face, away from the center of the diver's viewing area. The exhaust valve and the diaphragm have been combined into a single unit to reduce the number of moving parts.

The purge button is not a button at all, but a long bar that runs horizontally across the exhaust valve/diaphragm cover. It is accessible even while wearing gloves or mittens.

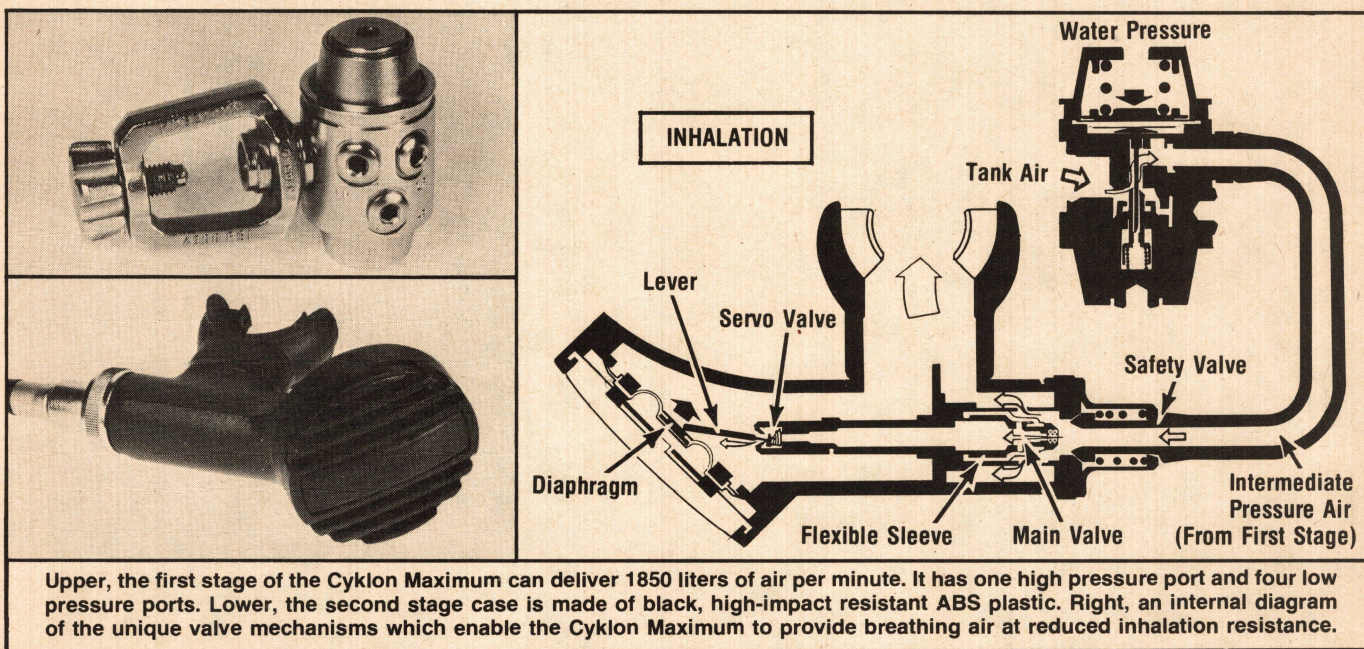
Intermediate air is delivered to the second stage at about 128 psi, where it is reduced to ambient pressure by means of a unique, balanced, servo-assisted combination valve. In very simple terms, this

open up the main air ports. Air can then flow into the main cavity of the second stage and from there to the diver. When inhalation has stopped, the pressure builds back up to ambient within the main cavity, the diaphragm returns to its normal position, allowing the tilt valve to close. Pressure then builds up within the tube, and behind the sleeve. When this pressure is again equal to the intermediate pressure, the flexible sleeve re-expands, closing off the main ports. In this way, the small tilt (servo) valve assists or controls the opening and closing of the main (sleeve) valve. The design is completely balanced, and is little affected by changes in the intermediate pressure. As a consequence, neither the tilt nor the main (sleeve) valve will open to vent off

fairly constant in almost all positions except one: when lying on my back, looking up, the inhalation resistance increased measurably... but this is a common trait of single hose regulators in general.

The Maximum was able to supply large volumes of air upon demand — easily. Free flowing problems were not unusual. When away from the mouth, the second stage would free flow with great enthusiasm if the purge were depressed, or the mouthpiece turned up while the main cavity was still full of air. But this could be easily stopped by placing the mouthpiece down and allowing air inside to escape through an upturned exhaust valve.

One idiosyncrasy of this regulator is the momentary hiss of escaping air when the air supply is turned on. This is quite



combination valve is a hollow tube (refer to the diagram) with an upstream tilt valve at one end, a restricted opening at the other, and a section of the tube surrounded by a flexible silicone rubber sleeve (called the low pressure sleeve). When the air in the combination valve has reached equilibrium (equal to the intermediate pressure) the tilt valve is closed, and the sleeve is held against the main air ports, sealing them off. As the diver inhales, or the purge bar is depressed, the diaphragm moves inward, pushing on the lever which opens the tilt valve. Air then escapes from the tube. Because air flow into the tube is slowed by a restricted opening, the air pressure inside (and behind the sleeve) drops, allowing the flexible sleeve to collapse and

excessive intermediate pressure, so a safety relief valve has been incorporated into the second stage hose connector.

A nice feature of this second stage is that it has no top or bottom, which simplifies the process of buddy breathing. With the buddies facing each other, the second stage needs only to be rotated to move the mouthpiece from one side to the other — no twisting or kinking of the hose.

In actual use I found the Cyklon Maximum to be a responsive regulator. Exhalation resistance was practically imperceptible in the normal, head-up position, and only increased slightly in the worst position (exhaust valve facing down). In the head-up position, I did sense a slight inhalation resistance, which remained

normal, and occurs only briefly until the combination valve reaches equilibrium. Just the same, it is wise not to look into the mouthpiece until the noise stops.

Recommended routine maintenance is similar to that of any good regulator. Professional service is suggested at least once a year. Regarding service, there is one word of caution: both stages should only be lubricated with acid-free Vaseline, as silicone sprays and grease may damage the low pressure sleeve.

If Poseidon's purpose was to develop a low maintenance, high performance regulator, then the Cyklon Maximum is a success. It sells for \$220 at your nearest dive store. For more information contact Parkway/Poseidon, 241 Raritan St., South Amboy, NJ 08879.



The Secrets of Fish Photography

Text and Photography by Jim and Cathy Church

Fish photography isn't always easy, but if you take time to develop your techniques, fish may become your favorite underwater subjects.

Begin with fish that are easy to approach. In commonly-dived areas, local guides can often take you directly to their own pets. And if divers have been feeding the fish in the past, finding friendly individuals may not be a problem — the fish may well find you! If you're new to the area, and won't be diving with a local diver, at least ask which fish are easiest to approach. Although answers will vary from site to site, we've found that gray angels, groupers, yellowtail snappers, sergeant majors and any fish that rely on camouflage are easier to approach than are queen angels, boxfish and many triggerfish. And in general, fish inhabiting the commonly-dived sites (providing that they aren't being

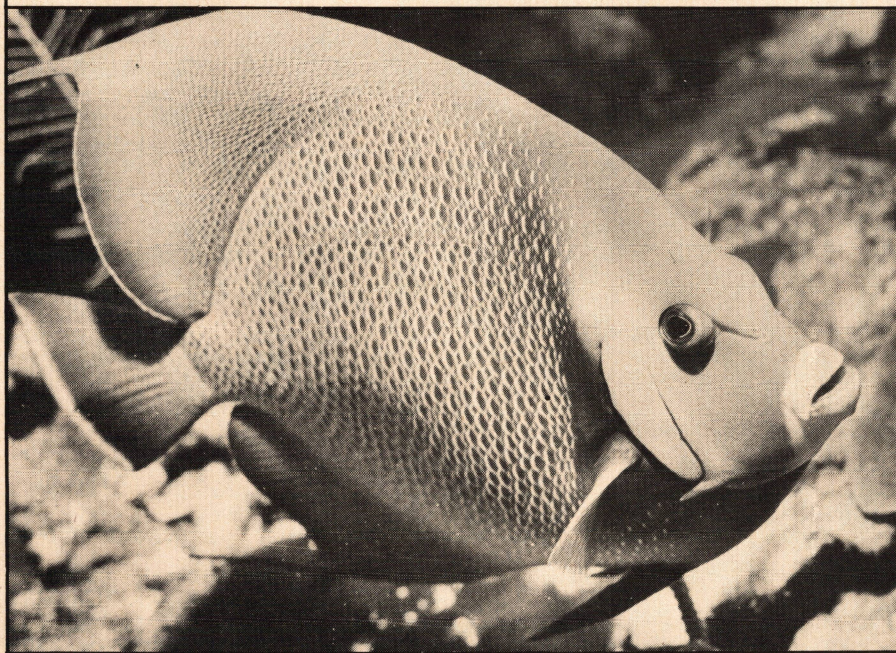
For broad scenic shots that show schools of fish, and possibly entire divers, a wide-angle lens is a must. We suggest a 15 or 20 mm lens with a 35 mm camera. For scenics showing less area, or for portraits of large fish such as sharks, a 28 or 24 mm lens is a good choice. For a portrait of a large angelfish, or a small group of grunts or soldierfish, a Nikonos 35 or 28 mm lens, set for minimum distance, is a good choice. You can also take good fish portraits with the normal lens of a housed camera (usually about a 50 mm lens with a 35 mm camera).

For close-ups of squirrelfish, banded butterflyfish and other small critters, a 50 or 55 mm close-focusing lens (called macro or micro) and a housed 35 mm camera is often best. Looking back at the Fish of the Month photos in the past issues of SDM, you will see that most of

12-28 for the Nikonos 28 mm lens, produce picture areas of about 8 x 12 inches. Squirrelfish, coneys, the heads of eels and numerous fish fit these lenses nicely. Other supplementary close-up lenses are available for smaller or larger pictures. And for the really tiny fish that stays in place, such as a tiny goby peeking out from his hole, extension tubes allow you to photograph picture areas down to the size of a postage stamp.

Specialized fish close-ups can be taken with wide-angle lenses, providing that the lens can be focused down to a foot or less from the film plane. Such lenses — which include the Nikonos 15 mm lens, Sea & Sea 20 mm lens for the Nikonos, and the wide-angle Subawider adapter that fits over the Nikonos 35 mm lens — produce a wide-angle perspective. If a fish were between your camera and a posing diver, for example, this wide-angle perspective makes the fish appear abnormally large in proportion to the diver. Thus, a six inch squirrelfish can become huge in your picture.

Opposite, a diver adds size perspective to this midwater shot of a huge Napoleon wrasse (*Cheilinus undulatus*). Below, a close-up portrait of a gray angelfish taken with a Nikon F camera using a 55 mm Micro Nikkor lens and Sportfinder.



speared) are usually tamer.

MATCHING LENS AND FISH

Choosing a lens that fits your fish, or choosing a fish that fits your lens, is a key element in successful fish photography. The fish should fit within the picture area of your lens at the closest camera-to-fish distance at which you can compose a pleasing picture. Any excess distance means that you must photograph through a greater number of suspended particles in the water and these reduce picture sharpness.

the fish portraits were taken with these lenses. We use a housed Nikon F (with the large Sportfinder and 55 mm Micro-Nikkor lens) to photograph fish that fit picture areas from about two by three inches, to about two by three feet. And for small fish that are hard to approach, we use the Nikon with a 105 mm micro lens.

For Nikonos users, supplementary close-up lenses are often used to photograph small fish. As examples, the Hydro Photo #3 and Novatek Plus/2 for the Nikonos 35 mm lens, and the Hydro Photo

COMPOSING YOUR PICTURE

If you are taking a portrait of an individual fish, the fish should fill at least one-third of the picture area. If it is too small, the viewer may have difficulty identifying the fish as the main subject. The picture will often be more dynamic if the fish is heading toward the camera at an angle, with more space in front of the fish than behind. Angles, in most cases, imply motion. A side view of the fish may provide a better documentary photograph, but produces a static picture. Tail shots — taken as the fish is escaping from you — can be used as an ending slide in a slide sequence, but usually can't stand alone as single pictures.

If depth of field is a problem, focus for the fish's eye! A viewer will accept an out-of-focus tail or fin as long as the eye is sharp. With an SLR camera, focus first for the eye and then shift the camera and viewfinder around to compose the picture. It is too easy to amputate the tail if you are concentrating on the eye in the center of the focusing screen. If the fish is moving toward you as you are focusing, trigger the shutter just before the eye comes into sharp focus. By the time the message gets from brain to trigger finger and trigger finger to the actual opening of the camera shutter, the fish will have moved in even closer. You must learn to anticipate the right moment to squeeze the shutter release so the eye will be in focus at the moment the picture is taken.

Fish can also be excellent supporting characters in your diver shots. A picture of a fish peering into a facemask, accepting a handout, helping a diver read an

U/W fishbook, tugging on a diver's bikini tie string or posing before another U/W photographer's camera, can add interest and humor to your slide show.

Schools of fish can form beautiful patterns that stand alone as pictures. In addition, schools of fish can provide pleasing backgrounds or foregrounds for diver/scenic shots. If you can compose your diver pictures with fish as supporting or background subjects, your pictures will often help evoke the feeling of being underwater.

Composing for documentation differs from composing for visual effect. You must record details for documentation — shadow detail, however artistic, can't mask features of the fish's anatomy. Natural activities, such as feeding, courtship, or symbiotic relationships become more important than enticing a grouper to take a look at its picture in a fishbook.

One of the keys to composition is to decide ahead of time what the purpose of your pictures will be, and then to take photographs that achieve it.

WATCH THE BACKGROUND

The background can make or break a fish portrait. A small fish can easily become lost in a cluttered background, and a colorful background can draw the viewer's eye away from a drab fish. Strong angles and leading lines in the background can upset the viewer's eye travel if these lines are not in harmony with the angle of the fish.

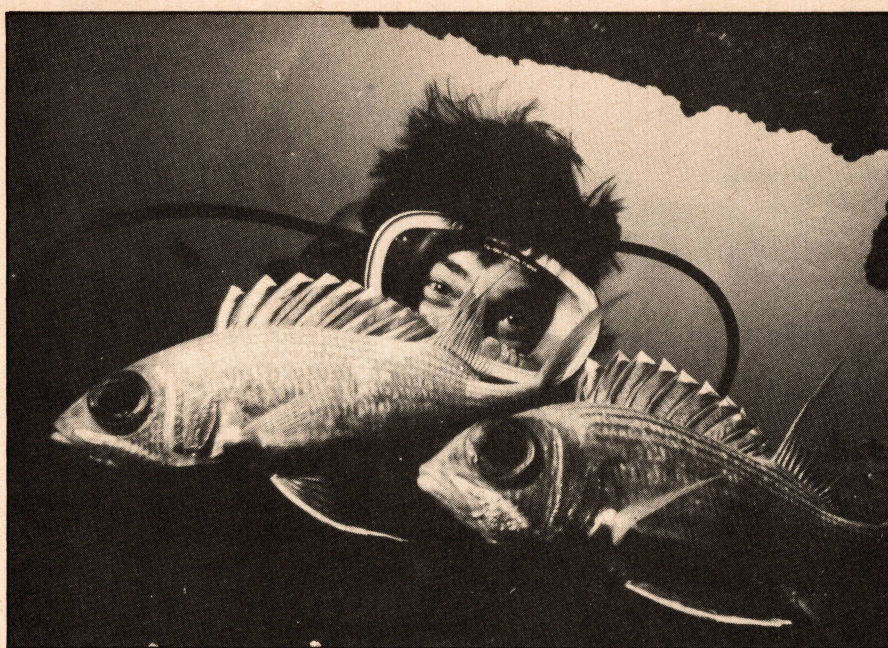
The background should enhance the fish portrait, not compete with it for the viewer's attention. One important exception, however, is when the background, such as coral, is actually the main subject and the fish is only a secondary subject that provides accent.

Some U/W photographers prefer a dark background which draws the viewer's eye to the near fish; some prefer a blue-water background; others prefer a natural background that shows the fish in its natural environment. A fish peeking out through an opening in wreckage or coral, or an eel's head framed with the opening of its lair are typical examples of natural backgrounds. Whatever background you prefer, be sure that your buddy doesn't get behind your subject. Unless he/she is posing, hands, fins, and even bubble streams can appear in your picture. The light skin of a diver's hand or body can show up even in close-ups.

BODY LANGUAGE

Have you ever wondered why a fish moved into easy camera range after you were out of film? Or when taking close-ups, and you raised your eye from the SLR viewfinder, were you startled to see that big barracuda staring at you from only a few feet away? The reasons are simple: fish seem to understand your body language.

You can't conceal your stalking behav-



ior when you are advancing on a fish with your camera. That fish lives in a fish-eat-fish world, and it knows that you are after it. It is only after you've exposed that last frame of film, and are ignoring the fish, that it moves in to inspect you. Therefore, your best technique is often to remain motionless on the reef — seemingly ignoring the fish — to entice them to pose. Many fish are territorial. They retreat when you appear, but may return if you stop moving.

To get closer to a skittish fish, try the circle around technique. Determine the direction that the fish is swimming and circle around one side until you are in or near the fish's path. If you can conceal your body behind coral or other bottom formations, your chances of getting closer will be improved. The important point is to avoid swimming directly toward the fish; whenever possible, position yourself in its path.

On commonly-dived sites, however, the effects of your body language on fish may be diminished. It doesn't take long for the yellowtail snappers, sergeant majors and other fish, fed by past divers, to begin following you around.

FEEDING THE FISH

Fish feeding for U/W photography is an art. Beware of the diver who dumps handfuls of bread into the water! The bread may attract too many fish for your picture, the rapid movements of fish in a feeding frenzy can lead to blurred pictures, and the bread forms a milky white cloud in the water. Small pieces of food are usually best. Remember, the purpose of the food is to encourage the fish to stay and pose. If you overfeed, the fish may eat and run.

Use small pieces of food to encourage the fish to swim where you want them to go. For example, Cathy and a photo student were working together to photo-

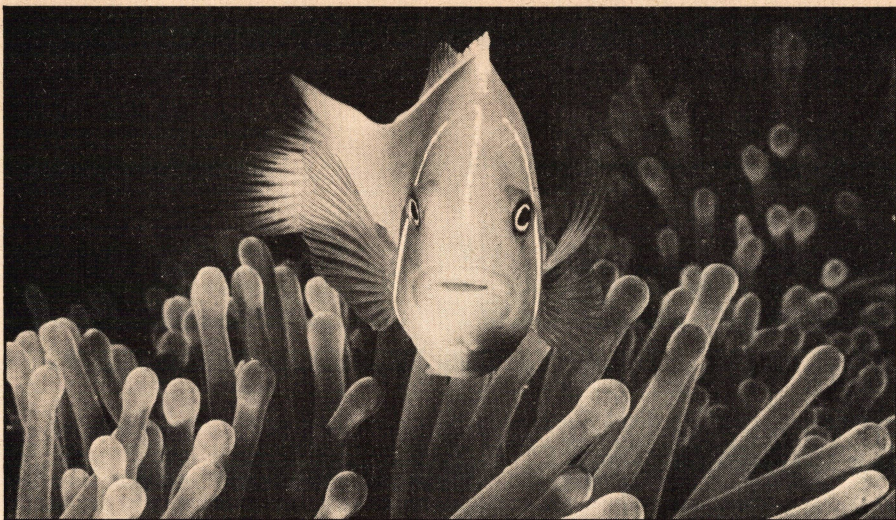
graph a yellowtail snapper. The student aimed the camera at a hole in a large seafan and waited. Cathy placed a piece of food behind the fan to lure the fish back there. Then, she dropped a small piece of food on the photographer's side of the fan, at the hole. As the yellowtail swam through the hole and took the food, the photographer snapped the picture. Even though it was a common fish, they had worked together to produce an uncommon picture.

When working by yourself, place pieces of food inside or between tube sponges, or into small openings in the coral to attract fish. When the fish moves in, it will often stop for a moment as it tries to locate the food. That's when you get your picture.

If the fish is interested in your food, and seems comfortable with your presence, you can often lure it from one locale to another. This is important if you want a change of background, such as from a sand bottom to undersea wreckage or a coral formation. You can also use the technique we call the line up. It works like this: Cathy swims outside of the picture area and releases some food in the water. As the fish swim to that food and devour it, Cathy swims back into the picture and releases food. When the fish swim back to Cathy for the additional food, they will be lined up in a parallel pattern for Jim's camera.

Don't put the food in a place where the fish doesn't want to go. If, for example, you place the food inside the territory of a damselfish, it will dart out and probably drive your subject away. Also, fish that prefer to hide in crevices may not venture out if you place the food too far from their hiding places.

What can you use for food? While dive guides at various resorts can offer the best advice, we'll make some general recommendations: Small pieces of raw



This clownfish was photographed using a Nikon F, 55 mm Micro Nikkor lens and two strobes. Opposite, this wide-angle close-up of squirrelfish was taken using a 15 mm lens from about six inches distance. The wide-angle perspective makes the eight inch long fish appear much larger in comparison to the diver's face.

fish are great, but aren't always available. A few pieces of cooked seafood or lean meat saved from dinner, however, are good substitutes. A chicken leg bone can also be used — you hold it by the lower end, and the fish goes after the upper end. Because you keep hold of the bone, the fish must come back if it wants more. At St. Thomas, USVI, we had good luck with tiny pieces of the white inner layer of an orange peel and with fragments of lettuce leaf.

Beware of greasy foods, such as scraps of pork sausage or bacon, because these coat your fingers and make it difficult to hold onto your U/W photo gear. Use a plastic film cassette container to carry small pieces of food. Punch a small hole in the lid so the container floods. This prevents the container from floating away, and prevents the food from wooshing out when you remove the lid.

Please don't break sea urchins for food at established dive sites. Why? Urchins provide important protection to many tiny reef dwellers, including some baby fish. And although you may believe that there are an infinite supply of urchins, the ecological balance of the dive site can be damaged if hundreds of divers break urchins within a certain area.

Fish feeding has its limitations. At a virgin dive site it may take time to slowly condition the fish to accept your hand-out. Thus, if pressed for time, feeding might not be a good technique. If spearfishing is popular in the area, don't feed the fish. It isn't fair — they become too trusting and easy prey.

HERDING FISH

A buddy who can herd fish toward your camera is worth his or her weight in gold! For close-ups, your buddy can herd with a hand or snorkel tip. We prefer, however, to use something natural — such as

a piece of dead staghorn coral — in place of the snorkel tip. Thus, if the coral accidentally shows up in the picture, it is less obvious than a red-tipped snorkel and may not be noticed.

Herdling is easier if you are directing the fish toward a place where the fish would like to go. For example, we found a pair of butterflyfish that were dining on a deposit of octopus eggs. Jim moved in to photograph the fish, but they spooked and swam away. Cathy circled around and herded them back toward the eggs. Once they returned to their meal, Jim was able to photograph them.

If you are photographing a school of fish within the confines of a cave or the hull of a wreck, stay motionless as your buddy drives the school of fish toward you from the far side. If you are silhouetting a distant diver in the opening of a tunnel, and wish to use a school of fish as foreground subjects, you may need a third diver to herd the fish out of the dark crevices and into the main tunnel.

Overzealous herding can be harmful to your subjects. An eel that has been prodded with a snorkel tip may panic and swim into the spines of an urchin, and this could be fatal! On night dives, you can drive a fish from its safe sleeping place. Let's give our subjects a break!

LIGHTING TECHNIQUES

Your sharpest fish pictures will often be taken close-up with a strobe. The brief flash of light from the strobe freezes both camera and subject movement. Because your strobe should light the fish's face, twin strobes (to left and right of camera) are sure to illuminate the face regardless of which direction the fish turns.

At longer distances, when sunlight overpowers the strobe and determines the exposure setting, the 1/60 or 1/90 second sunlight exposure can't always

stop action. And because the sunlight exposure is superimposed over the faster (about 1/1000 second or less) strobe exposure, you can get double images on film, causing blurred pictures. This is why you often get your best fish portraits on overcast days — the greater the amount of light the strobe contributes to the exposure, the sharper the pictures.

Use an accessory exposure meter to estimate how dark distant backgrounds will be. If your strobe exposure is f11, for example, and your meter reads f5.6 for the sunlight exposure, the background will be two stops underexposed (darker than the near subject). Remember that many fish have bright, reflective scales. Your normal strobe exposures for average subjects may overexpose some fish. Therefore, bracket in the direction of less exposure.

Balancing strobe light with sunlight is tricky when you are working with schools of fish inside caves or wrecks. For example, Jim wanted a sunlight exposure of Cathy silhouetted in the entrance of a tunnel, but he wanted a strobe exposure for the school of fish that was close to his camera. He set the aperture for a level midwater exposure meter reading before entering the tunnel; and inside, set his strobe for half power to illuminate the near fish. If the strobe had been too powerful, it would have overexposed the fish. And if Jim had closed the aperture to expose for the fish with a powerful strobe, the main subject (Cathy silhouetted in the entrance) would have been underexposed. If you don't have a low power setting on your strobe, a couple layers of handkerchief held over the reflector port with a large rubber band reduces light output by about one f stop.

Automatic exposure control systems with remote sensors will work, but you will have two problems: First, the auto sensor must read the light reflecting from the nearest fish. If the sensor misses the fish and reads the distant background, the automatic will overexpose the near fish. Second, if a sunlight exposure would require a higher-numbered f stop than that selected for automatic operation, the pictures will be overexposed.

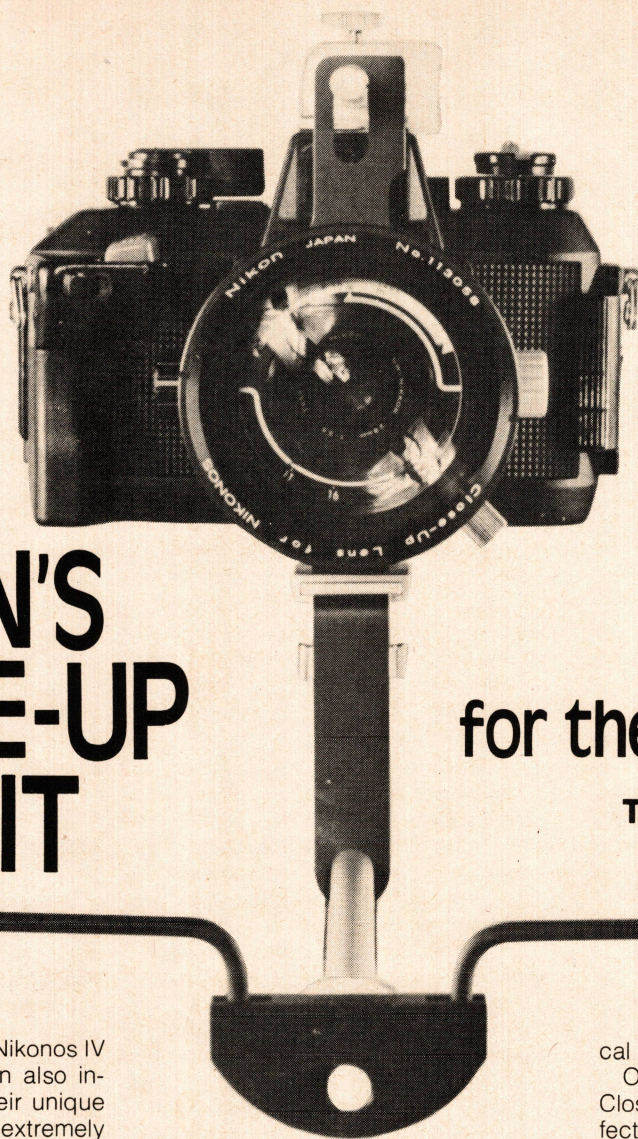
LEARNING ABOUT FISH

Being able to name the fish upon request can add impact to your slide shows. Fish identification books are usually available at dive resorts and local dive shops. While the best book will vary with the dive location, some general recommendations are: *Fishwatchers Guide to West Atlantic Coral Reefs*, Chaplin & Scott; *Guide to Corals and Fishes*, Greenberg; *Handguide to the Coral Reef Fishes of the Caribbean*, Stokes; *Pacific Coast Inshore Fishes*, Gotshall. If you can't find these at your local dive shop, all these, and many more marine life books are available through Sea Challengers, 1851 Don Ave., Los Osos, CA 93402. Write for a free catalog. 

NIKON'S CLOSE-UP OUTFIT

for the Nikonos IV

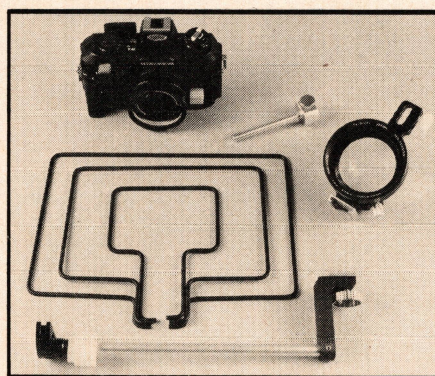
Text and Photography
by Geri Murphy



Along with the debut of the Nikonos IV underwater camera, Nikon also introduced a new version of their unique Nikonos Close-Up Outfit. This extremely desirable accessory system allows Nikonos users to obtain close-up pictures of invertebrate marine creatures and colorful reef fishes at a distance of only 9.25 inches from the lens.

The new version of the Nikonos Close-Up Outfit not only fits the Nikonos IV model but also the Nikonos III as well. In addition to its multi-model compatibility, the new close-up outfit boasts a few other improvements which make it irresistible to almost all Nikonos camera users.

Among serious underwater photographers, the Nikonos Close-Up Outfit is regarded as the supreme close-up attachment for Nikonos use. The heart of this system is a finely machined metal sleeve which slips over the primary lens and contains two precision ground glass lens elements. Because the Close-Up Outfit was designed by the makers of the camera, the optical design is perfectly matched with the opti-



The new Close-Up Outfit has anodized framers, support rod, locking thumbscrews, and will fit Nikonos III and IV.

cal formula of the Nikonos lenses.

One of the unique features of the Close-Up Outfit is that it will work perfectly with any of the three basic Nikonos lenses — the 80 mm, the 35 mm, and the 28 mm. A switch in lenses is quickly matched by simply changing the size of wire framer mounted on the front of the Close-Up Outfit.

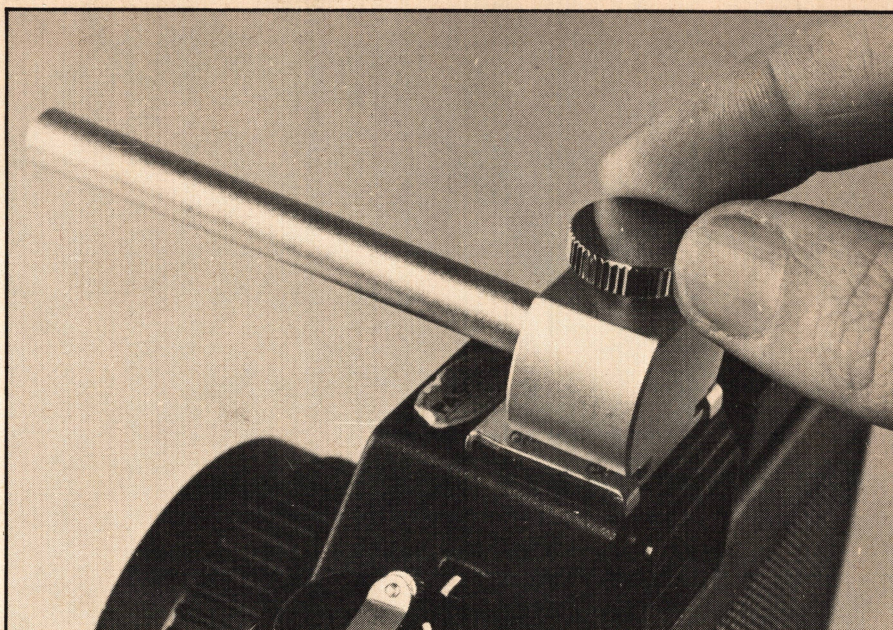
Still another unique feature of the Close-Up kit is the fact that it can be put on or removed underwater. The Nikonos Close-Up Lens is simply slipped over the front of the primary lens and locked in place by a thumbscrew. A small support rod inserted in the shoe mount at the top of the camera provides a second anchoring point. Furthermore, the four basic components of the Nikonos Close-Up Outfit can be easily assembled or disassembled underwater. The square wire framer can be quickly removed for positioning the close-up lens in narrow coral crevices, and the wire framer bracket arm can also be disconnected when working with shy reef fish.

Reproduction ratio (image magnification) with the Close-Up Outfit can range

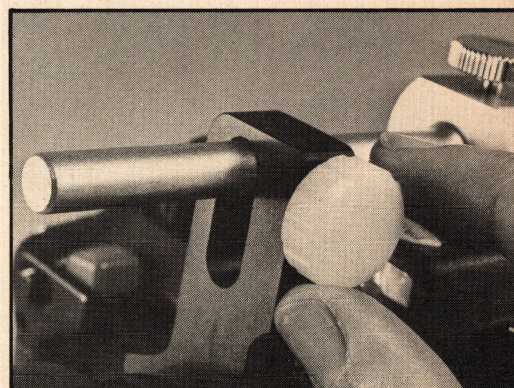
from 1:2.2 to 1:6 depending upon the primary lens being used. Image sharpness and depth-of-field focus are extraordinary owing to the excellent matching of lens optics.

The introduction of Nikon's new Close-Up Outfit is a direct result of a change in camera models. A new design was required because of the shift in the lens position on the Nikonos IV. The distance between the shoe mount at the top of the camera and the center axis of the camera lens is one-half inch longer on the Nikonos IV than on the previous Nikonos III. Since the mounting and clamping of the Close-Up Lens is directly dependent on both the shoe mount and lens, it quickly became obvious that the old version of the Close-Up Outfit would not fit the new Nikonos IV model.

Nikonos camera designers solved the problem by redesigning the metal frame of the Close-Up Lens. The top flange was lengthened and slotted to accommodate the differing positions of the support rod which is inserted in the shoe mount. In addition to the slotted hole, the flange was tooled for two separate threaded holes which accommodate the



Opposite, the new Nikonos Close-Up System — lens, black wire framers, support rod and bracket arm. Above, the support rod slips into the camera shoe mount and is tightened by a large locking screw.



Above, the elongated slot on the lens flange permits use with either the Nikonos III or IV cameras. The support rod slips through the slot and is secured by a nylon locking screw which can be placed in either of two threaded holes.



Left, the Nikonos Close-Up Lens easily fits over the front of the primary camera lens and is held solidly in position by the support rod and a thumbscrew which tightens into the camera bottom.

nylon locking screw. The upper hole is utilized for the support rod fitted onto a Nikonos IV, and the lower hole is utilized for the Nikonos III.

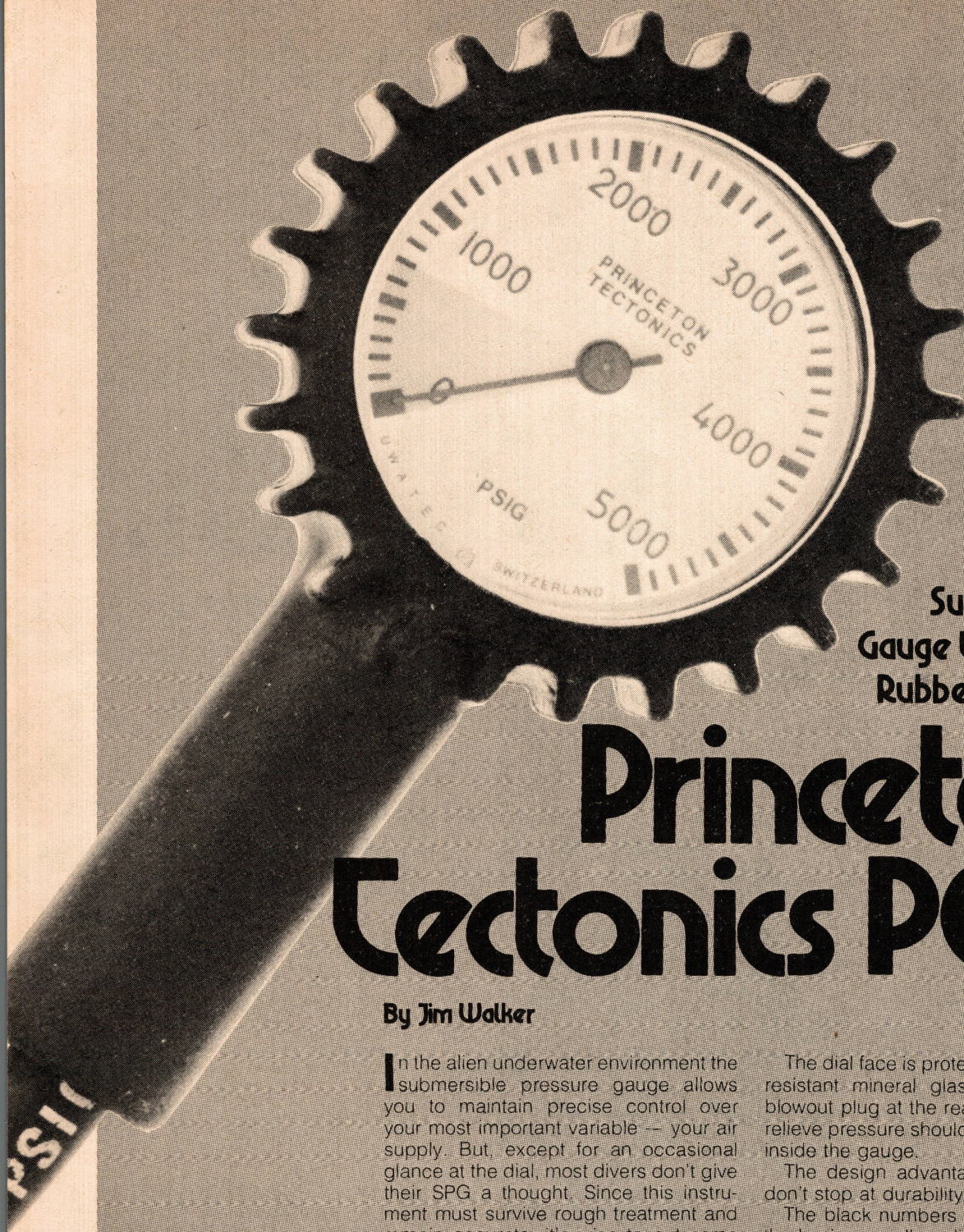
In addition to the redesigned lens frame, the new version of the Close-Up Outfit features two more engineering changes which will be welcome improvements for all Close-Up Outfit users. First, Nikon has replaced the highly polished stainless steel wire

framers with new versions that are coated with a non-reflective black anodized finish. The new coating helps close-up photographers avoid annoying light reflections from the flash that tend to creep in to the edges of the picture.

Still another helpful change is the addition of a threaded locking screw on the top of the small support rod. This positive locking feature assists in easy and quick assembly of the Close-Up Outfit

and helps to prevent accidental loss.

Once again, Nikon has taken a good idea and made it better. The new Nikonos Close-Up Outfit not only fits a variety of Nikonos cameras but also performs much better than its predecessor. For more information about the Nikonos Close-Up Outfit write to: Richard LoPinto, Nikonos Product Manager, Nikon Inc., 623 Stewart Avenue, Garden City, NY 11530. ➤



**A Sturdy
Submersible
Gauge With A Big
Rubber Bumper**

Princeton Tectonics PG-1

By Jim Walker

In the alien underwater environment the submersible pressure gauge allows you to maintain precise control over your most important variable — your air supply. But, except for an occasional glance at the dial, most divers don't give their SPG a thought. Since this instrument must survive rough treatment and remain accurate, it's wise to put some thought into its purchase.

Princeton Tectonics has a new SPG that's worth investigating. The PG-1 has obviously been designed to stand up to the abuse divers give their instruments:

The Swiss-made, spiral-wound Bourdon tube — the heart of the mechanism — is secured inside a rugged, chrome plated brass case. The case is O-ring sealed and surrounded by a protective rubber boot. The boot has a unique finned design which increases its shock absorbing ability. The base of the boot extends over the swivel joint at the gauge/hose connection to reduce hose strain. (The boot can be easily removed when mounting the gauge in a console.)

The dial face is protected by a scratch resistant mineral glass crystal and a blowout plug at the rear of the case will relieve pressure should an air leak occur inside the gauge.

The design advantages of the PG-1 don't stop at durability:

The black numbers contrast well with the luminous yellow dial face, providing easy reading, even in low light conditions. A red caution zone on the dial alerts the diver when his/her air supply is getting low.

The PG-1's 4000 psi service pressure can easily accommodate today's higher pressure tanks. The gauge hose (5000 psi rated) is available with end fittings to suit all popular U.S. and foreign regulators and the gauge itself is fully repairable at the Princeton Tectonics factory in Trenton, NJ. (The gauge is covered by a one year limited warranty.)

The PG-1 SPG costs \$80. For more information see your Princeton Tectonics dealer or write: Princeton Tectonics, P.O. Box 8057, Trenton, NJ 08650. 

THE PELICAN SABRELITE



The Sabrelite System 2000 — light, charger, ni-cads, bulbs, spare O-ring, and Guard Box.

BY BONNIE J. CARDONE

A funny man, the Head Pelican, he won't put anything on the market until he's absolutely satisfied with it. And, he'll go to great lengths and spare no expense to get that satisfaction. That's why the Pelican Sabrelite, introduced at last year's DEMA Show in January, didn't make its appearance in dive stores until November. The months in between were spent perfecting the light — and I have a drawer full of spare parts to prove it.

The Sabrelite is small, just seven and one-half inches long, and less than two inches in diameter. It seems simple. A sturdy one-piece ABS plastic cylinder houses three C cell batteries. An O-ring sealed, clear plastic lens cap with an opaque shroud, screws onto the end. Two quartz halogen lamps can be used with the light: Both burn for 30 hours and are surprisingly bright. The S4A (.86 amps) can be used with either disposable or rechargeable batteries; the S4B (1.5 amps) can be used only with rechargeables.

You can buy just the Sabrelite and use disposable alkaline batteries in it. These will provide a maximum burn time of four and one-half hours of high intensity light. If you buy the Sabrelite System 2000, you get the Sabrelite; a charger; three CH35 Eveready nickel-cadmium batteries; both the S4A and S4B lamps; a spare O-ring and O-ring grease; and, a pre-cut foam lined Pelican Guard Box to keep it



photo/Bonnie Cardone

The Pelican Sabrelite is small and handy — perfect for exploring U/W crevices.

all in. The rechargeable System 2000 1.2 amp. hour batteries provide one hour, 45 minutes of light with the S4A and one hour, 15 minutes of light with the S4B lamp. Also available for an extra charge, are super high capacity (1.8 amp. hour) ni-cads that increase burn time to two and one-half hours with the S4A lamp and two hours with the S4B. The System 2000 sells for \$69.95; the light alone, with no batteries, is \$29.95.

As I said, the light seems simple — so why do I have all those spare parts? Well, I wanted a light early, so I could do the testing and evaluation necessary for this article. Head Pelican, Dave Parker, sent me a production model. However, when the lights started coming off the assembly line, quality-control minded Parker kept finding things he felt should be improved. He replaced the smooth, polished reflector with a faceted one that made the beam more intense and eliminated dark spots. He decided the main spring was flimsy and replaced it with a

sturdier stainless steel version. Lens caps on the early models had tiny bubbles in them. Most people wouldn't have noticed those, but Dave Parker did and he replaced them with new, perfect caps. Finally satisfied with the light, Parker stopped shipping replacement parts to me and started shipping Sabrelites to the dive stores.

After all the hassle, you might wonder how well the light performs. Obviously, that was not left to chance either: It's a great little dive light. Compact but bright, it weighs 11.5 ounces above water and is slightly negative underwater. When you set it down, it stays down. It has a lanyard and slides as well as a sturdy belt clip so it can be attached to your weightbelt or tank strap. When the lens cap is screwed on, it takes three complete turns before contact is made and the light goes on. Thereafter, only one turn is needed to turn it on and off, eliminating the possibility that it can be turned too many times underwater and flooded. The only possible place for leakage is around the lens cap. If it does flood, simply wash it out with fresh water, dry it, clean all the contacts, and it is ready to use again.

The System 2000 has a Sabrelite 110V AC charger. UL approved, it is made of corrosion proof stainless steel and plastic. An LED light clearly shows you when the charger is on. The monitor will not light if there is a dead battery in the charging module or if a battery has been inserted in the module upside down. New ni-cads take a complete charge in 12 to 14 hours; after they have been used several times this will decrease to about eight hours. Since the batteries are charged outside the light, you can be charging the ni-cads while you are using the light with disposable batteries.

Care of the Sabrelite is easy. Rinse it with fresh water and let it dry. When you turn the light off, do so with two turns instead of one to ensure that it won't go on accidentally when it is not in use. Lubricate the O-ring that seals the lens cap before every dive — otherwise the cap is hard to turn. If you want to check the O-ring seal when the cap is on, pull the shroud off: the O-ring is clearly visible through the clear plastic lens. The shroud slides off and on easily, but be sure to mate its grooves with those on the lens cap.

The Pelican Sabrelite is available in yellow or black. The color used in the yellow light was specially compounded to be highly visible underwater. The black light has been selected by the U.S. Special Forces for use by Counter Insurgency Strike Teams.

The Pelican Sabrelite and Sabrelite System 2000 are finally being sold at your dive store. I think you'll find they were well worth waiting for. For more information contact: Pelican Products, Inc., 23763 Madison Street, Torrance, CA 90505. 🐟



An U/W Plotter for Diver Navigation By Eric Hanauer

Inland divers often have a difficult time pursuing their favorite sport. To begin with, many are snowed out six months of the year. Then, when weather permits, they will jump into any body of water larger than a swimming pool: a lake, a pond, a quarry, or even a flooded strip mine. Visibility is often marginal, and when it is clear the scenery usually consists of junked car bodies, bed-springs and beer cans. I know, because the first seven years of my dive career were spent in the Chicago area in just such conditions. Unlike their counterparts in coastal areas where the ocean is readily accessible, landlocked divers must continually invent new challenges to keep them going. After all, what can you do while swimming over a mud bottom with less than five foot visibility?

H. J. "Dutch" Luchtel from Columbus, Nebraska came up with an answer to that question. He invented a navigational tool which can be used by divers to follow complex courses underwater, even in limited visibility. He calls it the Scuba Sextant.

Although it has a catchy name, it isn't really a sextant at all. It's a course plotting board, based on a device that ship and aircraft navigators used before computers and Loran came on the

scene. Made of a rugged plastic, the board is small enough to fit in the diver's hand, or can be stored in a wetsuit or BC pocket. The base board features a grid, divided by bold lines into squares. Each bold square is divided into 100 smaller squares (10x10) by lighter lines. A translucent overlay, with a compass ring imprinted on the perimeter, lies on top of the grid. A brass eyelet in the center allows the ring to be rotated over 360 degrees. The diver can plot his/her travels on the rotating disc, moving it to correspond with course changes on a compass.

The back of the sextant serves as a slate for writing messages underwater. Two large eyelets are provided at the top for attaching a pencil and for securing the device to your gear.

For absolute accuracy, the diver should travel at a constant rate. This rate can be determined by counting fin kicks or timing the swim. Consistent pace is the most difficult part of underwater navigation, because such factors as fatigue and uneven terrain can cause variations. This is especially true if the diver is engaged in activities such as hunting, photography or sightseeing, but is still a problem even if a navigation exercise is the prime purpose of the dive.

A magnetic compass and a pencil are needed in addition to the Scuba Sextant. If distance is to be computed on the basis of time, the diver will also need a dive watch. In the pamphlet packed with the sextant, Luchtel illustrates the use of the device in a simulated dive. If you plot a course on the sextant according to these step-by-step instructions, you will be surprised at how easy it really is.

When used according to the instructions, the Scuba Sextant adds a new dimension to underwater navigation exercises. In their present open water courses, both NAUI and PADI require students to follow a simple compass course and return to the starting point. The Scuba Sextant allows the instructor to teach a more sophisticated form of navigation, in which the diver must find his/her way back underwater after several changes of direction. This skill might be presented in an advanced diving course, or a specialty course in underwater navigation.

In a real-world situation, the sextant can be a valuable tool when diving at night or in limited visibility.

The device sells for \$16.50. For more information write: Scuba Sextant, 3016 30th Street, Columbus, Nebraska 68601.

THE Emergency Breathing System

A mini bailout bottle for sport divers

BY CHRIS McLAUGHLIN

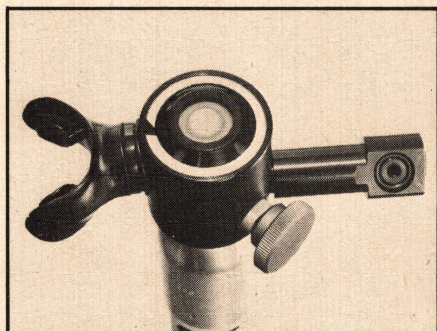
The Emergency Breathing System (EBS) is one of the latest products to come onto the scuba market to help increase the safety of diving. Basically, it is a small bottle complete with a one stage regulator. Its purpose is to eliminate the potential hazards of buddy breathing and/or octopus breathing. In an out-of-air situation, a complete breathing system eliminates the need for risking physical contact with a panicked diver. The two cubic foot aluminum bottle has enough air to comfortably get a diver to the surface from 100 feet at the proper rate of ascent. The EBS comes with a stainless steel tank mount or a neoprene waist strap holder. The location of the system should be decided by the user and the nature of the dive. Like an octopus, the location of the bottle should be discussed with your buddy before the dive and signals for its use covered in a pre-dive check. The EBS weighs only two pounds, is 15 inches long and two inches in diameter. The compact regulator is made of aluminum and combines the diaphragm and exhaust valve in the same location.

Regardless of the various opinions on what methods are best to prepare for a possible out-of-air situation, it is obvious that having a little spare air will certainly help out. In addition, the EBS provides the user with an emergency back-up should he/she accidentally run low on air. At approximately \$150, this simple to use and maintain device should be an asset to safety conscious divers and instructors. The EBS is a complete miniature scuba system and can only be sold to certified divers. It is not designed to substitute for an octopus, but is instead a complete independent back-up air supply. The EBS is distributed by Imperial.

For more information contact: Imperial Manufacturing Co., P.O. Box 4119, Bremerton, WA 98310, or Submersible Systems, Inc., 16442 Gothard St., Unit G, Huntington Beach, CA 92647.



photo/Chris McLaughlin



PPC staff photos/Pat Brollier



Right, the complete EBS. Upper, San Salvador divemaster, Garth Easton, tests the EBS. Lower, the top of the EBS, showing the mouthpiece, airflow adjustment knob and fill adapter. The aluminum bottle can be filled to 1800 psi from any scuba air compressor.

EBS AIR SUPPLY

Use the EBS air supply wisely when making an ascent, to avoid waste. To conserve air, blow the water out rather than using the purge button. Remember, if using the purge button, only a small amount of water will be in the regulator's internal passages.

Another point of importance is the deeper you are, the more air will be required for each breath. Move to shallower water as soon as possible and breathe only what is absolutely needed at the deeper depths.

To illustrate, assume a diver has a three liter (3.3 quart) tidal volume on the surface of the water. At 99 feet the pressure is four times that of the surface. The diver would need 12 liters (3 liters x 4 atmospheres) of air to fill his/her lungs to the same volume. It requires 400 percent more air at this depth to expand the lungs to the surface volume.

The following is an example of an air conserving ascent:

	DEPTH IN FEET	AIR USED	ACCUMULATED AIR USED
First breath at	99	3L x 4A* = 12LPB*	12L
Second	66	3L x 3A = 9LPB	21L
Third	33	3L x 2A = 6LPB	27L
Fourth	33	3L x 2A = 6LPB	33L
Fifth	16½	3L x 1½A = 4½LPB	37½L
Sixth	10	3L x 1½A = 4LPB	41½L
Seventh	5	3L x 1A = 3LPB	44½L = 3½L remaining
Contrast this to	99	at 3L x 4A = 12LPB x 4 Breaths	48L = 0L remaining

*LPB = Liters Per Breath

*L = Liters

*A = Atmospheres



MORROW'S

DIVE RAY

Gives you super vision - up to 99 feet away

Text and Photography by Howard Hall

Most new products are simple, often ingenious, modifications of basic dive equipment. Only rarely does a brand new piece of equipment come along that could cause a major change in the way we dive. Such an item is the new Morrow Dive Ray.

A compact, hand held sonar device, the Dive Ray is small and durable enough to be carried on a BC waist strap or in a pocket. It can greatly extend the diver's limited range of senses. To operate the unit, the diver holds the Dive Ray like a pistol and points it at the area to be investigated. When the trigger is pressed, ultrasonic waves are beamed through the water and any objects in their path send back reflections that are recorded by the instrument. The recordings in the form of large LCD numbers are displayed on the back of the Dive Ray. These numbers tell the diver how far away an object is, up to 99 feet. If there is nothing within 99 feet, the recording screen will be blank. If the unit senses an object beyond 99 feet and nothing closer, a light will blink on the panel. The Dive Ray has a 15 degree beam angle that provides a coverage circle up to 30 feet in diameter. It is accurate to within six inches.

If you dive in crystal clear tropical waters you may have difficulty recognizing applications for this instrument. If, on the

other hand, you dive in areas of limited visibility, the possibilities are infinite!

In the turbid waters of the North Atlantic or the Great Lakes, divers could kneel on the bottom and scan for the presence of wreckage in a circular area with a 200 foot diameter. As the diver moves across the bottom, he/she could scan ahead and to either side for nearly 100 feet.

Even if you are not looking specifically for wrecks, the Dive Ray can serve to locate other important topographical features. If you are diving for lobster or abalone in California you could use it to locate rock outcroppings and ledges where these critters hide. Even in 30 or 40 foot visibility you might otherwise have passed by good hunting areas. And if you are a spearfisherman, the Dive Ray can serve to locate schools of fish that are beyond your visual range.

There are two other objects the Dive Ray can help divers locate in limited visibility. The dive boat is one of these. If you use a compass to help you return to the boat you know how difficult it is to be accurate every time. But, with a Dive Ray you could search the waters around you and find the boat before you pass it by. Another object that is often difficult to find underwater is your buddy. With limited visibility it is more than easy to



The Dive Ray operates on two nine volt transistor batteries. The hand held sonar is accurate to within six inches at 99 ft.

become separated. With the Dive Ray you can easily search the surrounding water and find your companion without surfacing.

The Dive Ray can also serve as a fathometer. Before anchoring your boat, you can check depth, topographical features and locate schools of fish. If you beach dive the Dive Ray can be used to check the depth and bottom features before you descend.

The Morrow Dive Ray is 12 inches long and three inches in diameter. Pressure tested to 100 feet, it has neutral buoyancy. It is made of high strength plastic and powered by two, nine volt transistor batteries. It sells for \$169.95 at dive stores. For more information write: Morrow Electronics, P.O. Box 7078, Salem, OR 97303.

Scuba Quiz

Category: Respiration

By Dennis Graver

Experienced divers may not pay much attention to their breathing while diving, but they probably should. There's a lot more to respiration in and under the water than simply moving air in and out of the lungs periodically. Take a deep breath and test your knowledge of this important subject. The answers are on the following page.

1. Slow, deep breathing is the respiratory pattern recommended for divers because:

- ☐ A. Compressed air is difficult to breathe using other patterns
- ☐ B. It makes the most efficient use of the air that is breathed
- ☐ C. Lung damage is likely to occur if any other pattern is used
- ☐ D. Scuba equipment cannot deliver large quantities of air rapidly

2. Breathing resistance increases with depth owing to:

- ☐ A. Increased air density at higher pressures
- ☐ B. Turbulent versus laminar air flow in equipment
- ☐ C. Turbulent versus laminar air flow in body air spaces
- ☐ D. All of the above except B
- ☐ E. All of the above except D

3. Which of the following factors have the greatest effect on a diver's air consumption:

- ☐ A. Depth and temperature
- ☐ B. Activity and lung volume
- ☐ C. Depth and lung volume
- ☐ D. Activity and depth

4. When a diver hyperventilates excessively before a breath-hold dive and loses consciousness as a result, the blackout is most likely to occur when the diver:

- ☐ A. Is descending
- ☐ B. Is on the bottom
- ☐ C. Is ascending
- ☐ D. Is apprehensive

5. The breathing pattern of a diver experiencing difficulty in the water will usually be:

- ☐ A. Rapid and shallow
- ☐ B. Slow and shallow
- ☐ C. Rapid and deep
- ☐ D. Slow and deep
- ☐ E. None of the above

6. Select the answer describing the extent to which a person can inflate his/her lungs underwater compared to inflation on land:

- ☐ A. 100 percent
- ☐ B. 90 percent
- ☐ C. 85 percent
- ☐ D. 70 percent
- ☐ E. 64 percent

7. The primary stimulus to breathe stems from increasing CO₂ levels in the body. A symptom of low oxygen level in the body is:

- ☐ A. No symptoms
- ☐ B. Tunnel vision
- ☐ C. A twitching diaphragm
- ☐ D. Tingling at the extremities
- ☐ E. Dizziness

8. Oxygen Debt means that:

- ☐ A. Not enough oxygen is being breathed to meet the needs of the body
- ☐ B. Oxygen in body tissues has been consumed and is not being replaced by circulation
- ☐ C. The blood is not receiving an adequate supply of oxygen from the lungs
- ☐ D. The heart is not capable of delivering an adequate supply of blood to the body
- ☐ E. The CO₂ level in the body is abnormally high

9. Lung volume, regulated by breath control, can affect the buoyancy of a diver by as much as:

- ☐ A. 2-3 pounds
- ☐ B. 3-5 pounds
- ☐ C. 5-7 pounds
- ☐ D. 7-9 pounds
- ☐ E. 9-11 pounds

10. Skip breathing, or holding each breath momentarily while scuba diving, is not recommended because this practice:

- ☐ A. Leads to CO₂ excess
- ☐ B. Can lead to air expansion injuries
- ☐ C. Causes edema in the lungs
- ☐ D. A and B, but not C are correct
- ☐ E. None of the above

Scuba Quiz

Answers: Respiration

1. B. It makes the most efficient use of the air that is breathed. Assuming an average lung volume of 10 pints and a residual lung volume of two pints, a diver breathing shallowly (three-four pints) loses the value of one pint of the inhaled air in dead air spaces in the mouth, throat and other airways. With deeper breathing, the percentage of air lost in the dead air space is decreased. Deeper breathing also helps prevent CO₂ excess in the body.

2. E. All of the above except D. Breathing air pressure and density increase with depth. Denser air means more molecules to be moved with each breath, hence the resistance to flow. The increased density also causes turbulence in the moving air, which further restricts flow in both the equipment and the diver's airways. The deeper one dives, the greater the problem. It is important to reduce one's activity as breathing resistance increases.

3. D. Activity and depth. The amount of air used is directly proportional to the depth — twice as much is used at 33 feet as at the surface, three times as much at 66 feet, etc. Activity can increase a diver's air consumption by as much as eight times the resting rate. To make efficient use of air, dive shallowly, limit activity and breathe slowly, deeply and continuously.

4. C. Is ascending. Excessive hyperventilation reduces CO₂ in the body to such a low level that a person will become anoxic before being stimulated to breathe. Because of increased partial pressures of gases at depth, a breath-hold diver can use oxygen in the lungs quite efficiently, but during ascent, the decreasing partial pressure of oxygen, coupled with a rising CO₂ level,

can combine to cause unconsciousness. This is frequently referred to as "shallow water blackout." Do not hyperventilate for more than three-four breaths when breath-hold diving.

5. A. Rapid and shallow. When anxiety increases, respiration tends to increase. But in the water, perhaps as a precaution, people usually attempt to maintain a large volume of air in the lungs. The result is shallow, rapid breathing with little air being exchanged in the lungs. This, usually combined with exertion, quickly leads to an excess of CO₂. If uncorrected, this breathing pattern can actually cause unconsciousness. If in difficulty when diving, make an extra effort to breathe deeply.

6. C. 85 percent. Because of pressure differentials in the lungs and other physical and physiological factors, we simply can't inhale as well in the water as we can on land. Some breath-hold divers have learned that greater inflation is possible by getting the lungs horizontal and as near the surface as possible when inhaling. Scuba divers must realize this respiratory limitation underwater and limit activity accordingly.

7. A. No symptoms. There is no warning at all for hypoxia. This lack of symptoms or awareness that hypoxia is approaching, is very dangerous. Low oxygen levels, such as those created with excessive hyperventilation or incorrect breathing while exerting strenuously, must be recognized as hazardous and avoided. Always use correct breathing habits when diving.

8. B. Oxygen in body tissues has been consumed and is not being replaced by circulation. When we first begin to exercise, oxygen in body tissues is quickly consumed before the heart and circulation are functioning at full capacity. Exercise can continue under this oxygen deficit for only a short period. This oxygen debt in the tissues must be made up at the completion of the exertion, or the level of exertion must be decreased until circulation can replace the lost oxygen. Failure to do so will result in a loss of ability to continue the exercise. Avoid a situation such as this by controlling activity at all times and not over-exerting.

9. D. 7-9 pounds. Average lung volume is about 10 pints with a residual volume of about two pints. Tidal volume is, therefore, about eight pints, or one gallon. Since a gallon of water weighs about eight pounds, this is the amount of buoyancy change one could experience between a full inhalation and a full exhalation. Many divers are unaware of the extent to which buoyancy can be controlled by breathing. While breath-holding is hazardous when compressed air is used, continuous breathing with different lung volumes can be used effectively to regulate buoyancy.

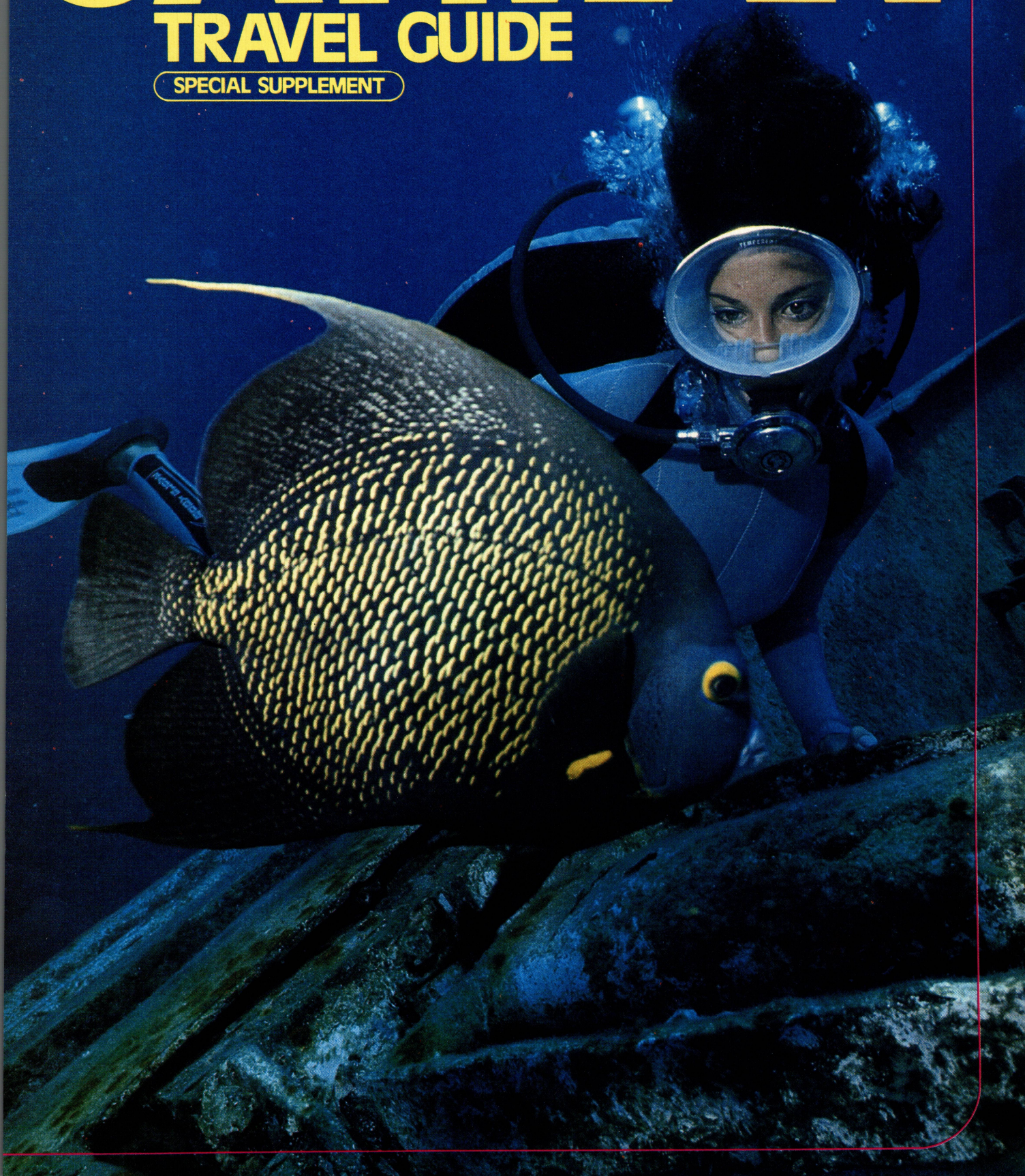
10. D. A and B, but not C are correct. Skip breathing is dangerous. The resultant high CO₂ levels can cause headaches and will decrease breath-hold ability in an emergency. Developing the habit of holding each breath can lead to lung expansion injuries during a moment of forgetfulness while ascending. Whenever you breathe compressed air, breathe slowly, deeply, and continuously.

Is there more to breathing than you thought? Hopefully, you noted the emphasis on two points: (1) slow, deep, continuous breathing, and (2) keeping exertion to a minimum. If you scored well in just these areas, exhale and congratulate yourself, for these are the most important aspects of the topic. Also, those with eight or more correct responses deserve increased lung volume for their fine understanding of respiration. If your knowledge of this subject is somewhat anoxic, you should consider studying a good book on dive physiology. . .

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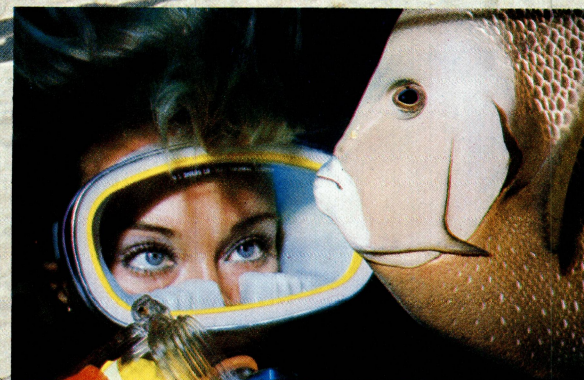


CAYMAN



A Cayman vacation can be a perfect blend of sun, sand,

Cayman Cover:
Ahuva Zaid with French angel
on the Oro Verde wreck.



Scuba Playground Of The Caribbean

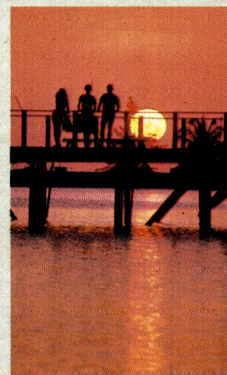
By Geri Murphy

One of the most often asked questions in dive travel today is: "What is there for mom and the kids?" Well, Cayman has the answer. Here is a Caribbean resort island which can offer high voltage diving for even the most hard core scuba diver and still keep the non-diving members of the family happy. Cayman offers more than just good diving; it has something special for just about everyone. Whether you are a beginner just out of scuba class or a 20 year diving veteran, Cayman will keep you entertained. The variety of dive services and underwater attractions is enormous and a visit to this friendly island is always a happy experience.

Should you decide to visit Cayman on your next dive trip, the follow-



sailing and scuba. The fabulous marine life and tropical sunsets of the Caymans are just a short flight from the U.S. mainland.



photos/Geri Murphy

ing guide may help you to get more out of your vacation investment. Whether it is your first visit or your 50th, the following will serve as a welcome checklist of travel hints for achieving the perfect vacation — for the diver and non-diver alike!

LOCATION

Cayman is located in just about the center of the Western Caribbean. It is 480 miles straight south of Miami, Florida, barely an hour and 20 minute ride by jet. Most important, it is surrounded by some of the warmest and most beautiful waters of the Caribbean, rich with giant sponges, black coral trees and schools of fish.

THE ISLANDS

Cayman is not one, but actually three islands. The largest is called Grand Cayman and the two smaller ones are known as Cayman Brac and Little Cayman. All three islands offer superb dive opportunities and have the necessary scuba facilities, hotels, dive boats and airports.

Grand Cayman is by far the most developed. This island is equipped with a modern jet airport, a variety of lovely hotels, many restaurants, night club entertainment, a freeport shopping district, a booming condominium development and a large financial banking establishment. It is a perfect vacation choice for someone desiring a full range of recreational activities including: tennis, sailing, jet ski rides, para-sailing, marlin fishing, sunbathing, and superb diving.

Cayman Brac and Little Cayman are small, undeveloped islands that are sparsely populated. They have fewer hotels and virtually no nightlife or shopping, but the diving is spectacular. Both islands are surrounded by virgin coral reefs and incredibly beautiful drop-offs that are hard to match. The two hotels on Brac and the one small hotel on Little Cayman cater specifically to the serious diver.

A British colony with a total population of approximately 16,000 residents, the Caymans have a very stable government, excellent economy, an English speaking population, and a cadre of expert dive guides and scuba instructors who have either lived or been trained in the U.S. The people of Cayman are very friendly, outgoing, talkative and seem to love American visitors. You will always feel welcome in this tropical paradise.

Despite its small size, Cayman has become an extremely successful and wealthy island nation. With 310 banks, Grand Cayman is now considered to be the investment capital and offshore banking center of the western hemisphere. It is often called the Little Switzerland of the Caribbean.

THE CLIMATE

One of Cayman's greatest attractions is its balmy climate which ranges between 75° and 85°F almost all year. In the summer, these islands are cooler and more pleasant than the majority of cities in the U.S. And, in the winter, it never snows or freezes in Cayman. The sun is always shining, and there is just enough breeze to make life comfortable. Most people in Cayman dress in tropical shorts, T-shirts and sandals. In the evenings, the dress is generally lightweight slacks and short-sleeve sportshirts.

The water temperature is just as warm as the air, ranging from 80°F in the winter to 85°F in the summer. An eighth-inch wetsuit jacket is sufficient for warmth, but many people also wear eighth-inch wetsuit pants to protect themselves from coral scratches and jellyfish stings.

HOW TO GET THERE

Travel to Cayman is just about as easy as hopping a commuter flight from New York to Boston. There are direct flights on a frequent basis from Miami, Houston and Tampa. Two airlines carry the majority of Cayman visitors — Cayman Airways and Republic Airlines. A smaller airline known as AeroSun carries divers to the Brac.

Cayman Airways, the official government airline, operates two jet flights daily from Miami plus one jet flight three times per week from Houston. The airline utilizes modern BAC-111 jets for these flights and serves a small snack and rum punch during the brief flight.

Cayman Airways also operates an inter-island schedule of two flights daily between Grand Cayman and Cayman Brac. A three engine, short take-off Tri-lander is used for this service, and the trip takes one hour. The same aircraft

also flies between the Brac and Little Cayman twice a day, four times a week.

Republic Airlines operates one flight daily from Miami to Grand Cayman using modern DC-9 aircraft. AeroSun International operates one flight per week (Saturday) from Tampa to Cayman Brac, continuing on to Grand Cayman. AeroSun utilizes a Convair 440 propeller aircraft and the flight takes approximately three hours.

For reservations or more information about specific flight times, you can contact the airlines serving the Caymans by calling the following phone numbers: Cayman Airways, U.S. Toll Free (800) 327-2864; Republic Airlines, U.S. Toll Free (800) 241-9385; AeroSun, U.S. Toll Free (800) 237-2077.

ENTERING THE COUNTRY

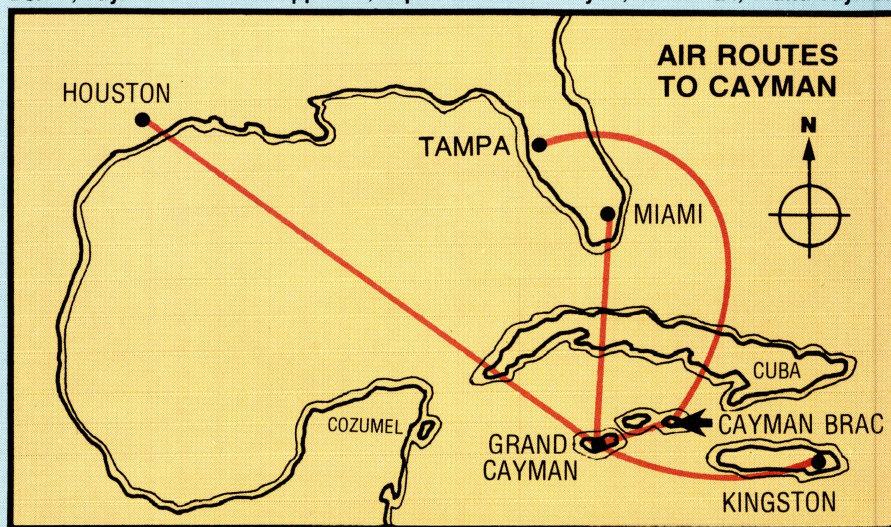
Although you will be entering a foreign country, you will be pleasantly surprised to find Cayman Islands government officials very cordial and efficient.

While you are enroute by air to Cayman, you will be given an immigration entry form. It is a simple card and takes only a few minutes to fill out and sign. Upon entering the Cayman air terminal, you will first pass through immigration processing and then have your baggage checked by customs.

Cayman immigration law requires three things of visitors; proof of citizenship, the completed entry form and a return air ticket. A passport is not necessary, although it is the easiest form of identification. As an alternative, you may present your birth certificate or voter registration card. One word of caution, however, an automobile driver's license is not acceptable as proof of citizenship.

After clearing immigration, you will be required to pick out your luggage and present it for inspection by a Cayman

Below, Cayman air routes. Opposite, tarpon at Josh's Canyon, North Wall, Grand Cayman.



photo/Bonnie Charles



Customs Officer. The Inspector will want to go through your suitcase, dive gear bag, and whatever carry-on luggage you may have. Do not attempt to smuggle or carry in any type of illegal contraband such as handguns, ammunition or explosives; the Customs people are very thorough.

One word of special warning. Do not attempt to bring in any sort of illegal drugs, and this includes marijuana. The Cayman Islands have the most severe anti-drug laws in the entire Caribbean.

Violators are immediately arrested and taken off to jail, and visiting tourists are not immune to this enforcement. Prosecuted violators can receive jail terms of up to ten years and fines up to \$20,000. Please, leave the drugs at home!

RETURN FLIGHT CONFIRMATION

Once you have arrived in the Cayman Islands, it is extremely important for you to confirm your return flight reservations.





Above: relaxing at Seven Mile Beach; celebrating Pirates Week; the Holiday Inn buffet. Right, an independent dive operator. Below, a parasail adventure at Seven Mile Beach.

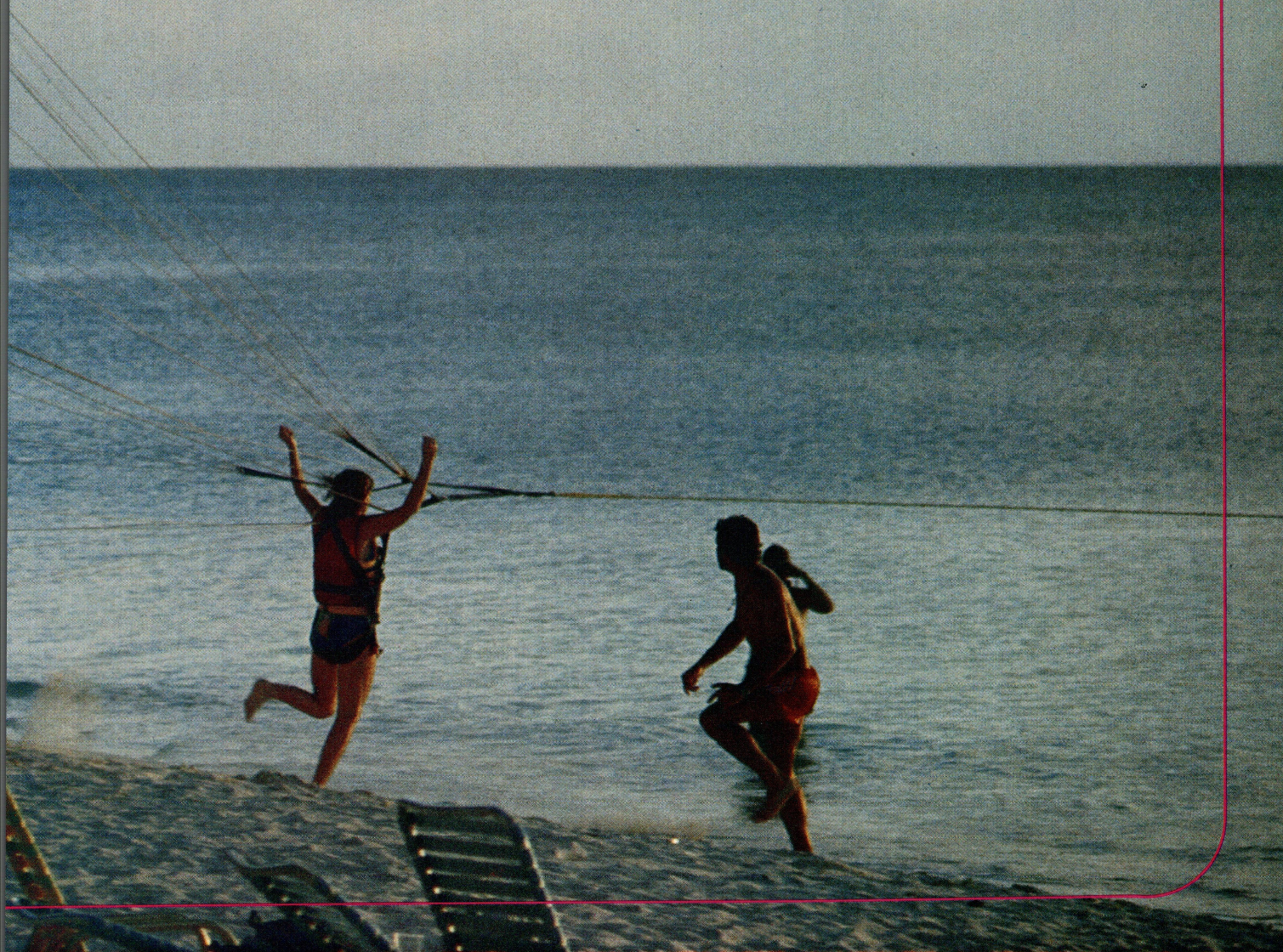


The best time to do this is the day of your arrival. You can confirm these reservations right at the airport ticket counter, or by telephone from your hotel, or by stopping at the airline ticket office in town.

If you do not confirm your return flight within 72 hours of departure, you could very well lose your seat. Most all flights departing Cayman go out full and available seats are quickly snapped up. The airlines only honor reservations which have been confirmed on the island — a computer automatically cancels the rest. Losing a reservation could result in waiting for another open flight a day or so later, and this could get expensive.

ISLAND TRANSPORTATION

Once you clear customs and step outside the terminal, you will find a long line of taxis, eager to take you to whichever hotel you desire. By Cayman law, taxis are the only vehicles that can make commercial pick-ups at the airport, so you will not find any hotel courtesy vans. However, Cayman taxi drivers are by far the friendliest cabbies in the Caribbean.



They are very talkative and eager to tell you about their wonderful island.

Perhaps the nicest thing about Cayman's taxis is the fact that they come in all sizes, including station wagons, passenger vans, and large sedans with ample trunk space. This is a welcome sight for divers lugging bulky gear bags and heavy camera cases. The ride to town or out to Seven Mile Beach is very reasonably priced and it only takes 15 to 25 minutes to reach most hotel destinations.

Should you desire your own transportation, you can rent a car. The largest auto rental agency on Grand Cayman is Avis Cico, with offices in George Town and at the Holiday Inn. Jeeps and compact Hondas are the most favorite rentals, but there are four-door sedans available as well. In order to rent a car, you must present a valid driver's license from

your home state or country. You will also have to purchase a Cayman Visitor's Driving Permit for \$3. It is also wise to purchase accident insurance when you rent a car. Be sure to reserve your rental car at the same time you make your hotel reservations, as there is often a shortage of cars during the busy tourist season.

CURRENCY

There are two types of currency in wide circulation among the Cayman Islands — U.S. dollars and the official currency of the Cayman Islands, C.I. dollars. Both are happily accepted by most hotels, gift shops, dive operators and other island businesses. However, if you pay for something in U.S. dollars, you are likely to receive your change in C.I. dollars.

The exchange rate between the two

currencies is very simple — \$1 U.S. equals \$.80 C.I. Or to turn it around, \$1 C.I. equals \$1.25 U.S. This does not mean that a C.I. dollar has a 25 percent greater value than U.S. money but simply indicates the basic exchange rate. In 1972, Cayman changed from the British system of Pound Sterling currency to the far simpler dollar system. At that time ten shillings were equal to \$1.25 U.S. and the C.I. dollar was established as the ten shillings equivalent. Because of the stable economy, Cayman's exchange rate with the U.S. dollar is pretty well fixed



throughout the island.

While most Cayman hotels accept credit cards, there are many restaurants, bars and smaller services which do not. It would be wise to bring a small amount of cash and the rest of your money in Travelers Checks in order to avoid the embarrassment of having a credit card refused.

HOTELS

There are at least 14 resort hotels on Grand Cayman, plus two more on the

Brac and a new one on Little Cayman. Most of these hotels cater to divers and have dive shops on the premises. You will find many of these dive oriented hotels advertising in this special supplement. In addition, the Cayman Islands Department of Tourism has published a 1982 Rate Sheet and Fact Folder which contains the addresses, telephone numbers and room rates of all Cayman hotels. You can obtain a copy of this by writing to: The Cayman Islands Department of Tourism, 250 Catalonia Avenue, Suite 604, Coral Gables, Florida 33134. The telephone number is: (305) 444-6551.

Cayman hotels span a wide range of accommodations, services, prices and

locations. Some are right in the heart of the action, on a wide sandy beach filled with many activities. Others are tucked away in more secluded areas and enjoy the luxury of a tranquil setting and a good deal of privacy. There are expensive, luxury type hotels complete with every facility and service, and there are more economical lodge-type facilities which cater to the hard-core diver. Your choice of hotel depends largely on your personal tastes, your own budget and the interests of the non-divers who may accompany you.

The greatest concentration of hotels is along Seven Mile Beach, perhaps the most beautiful beach in the Caribbean. It is on the west side of Grand Cayman, in the lee of the island, and fully protected from the prevailing trade winds. It is a wide and beautiful beach with clean, white sand. It is an ideal area for swimming, water skiing, jet skiing, sailing and para-sailing. It is also the most expensive piece of waterfront real estate in the Caribbean.

The hotels situated on Seven Mile Beach include: Beach Club Colony,

The Armchair Sponge at a depth of 50 feet off the west side of Grand Cayman Island.





Sarah Moody feeds tame fish above the wreck of the Oro Verde off Seven Mile Beach.

Coral Caymanian, Galleon Beach, Grand Caymanian Holiday Inn and Royal Palms. All five place a great deal of emphasis on beach activities and all offer dive services. In fact, most of the dive operators on Grand Cayman pick up their passengers right off the beach in front of these hotels. Also located in the same area, but across the street and away from the beach, is the Cayman Islander Hotel with slightly reduced prices. The Seven Mile Beach hotels offer visitors an excellent all around vacation opportunity, rather than just a concentrated emphasis on diving.

South of George Town, but still on the west side of Grand Cayman, are two dive resort hotels; Sunset House and Casa Bertmar. Both of these resorts are diver-style hotels, with slightly lower prices;

they cater primarily to serious divers. They host a great many dive clubs, schools and stores. While neither hotel has a sandy beach (ironshore instead) both have shallow depth coral reefs directly in front of their properties. These coral reefs are ideal for extra beach dives, macro photography, fish feeding and night dives.

North of Seven Mile Beach is a recently renovated resort called Spanish Cove. This is a small but fairly elegant resort with a new dive shop and a beautiful coral reef directly out from the hotel property. Since this resort is situated on the north shore, it has no beachline (ironshore again) but hotel guests are frequently bussed over to nearby Seven Mile Beach for swimming and sunbathing.

At the east end of Grand Cayman, the opposite end from Seven Mile Beach, there are two hotels which cater to divers and have dive shops on the premises. The east end is like another world, separate and apart from the normal Grand Cayman tourist scene. It is approximately a one hour drive from George Town; very secluded and extremely tranquil. A trip there is like going to another island. The Cayman Diving Lodge is a low budget hotel which caters only to experienced divers. Directly in front of the hotel dock is a shallow coral lagoon area; absolutely beautiful for night dives and macro photography. A couple of miles to the north is the Tortuga Club, more of an all-around beach hotel with sailing, fishing, snorkeling and scuba diving.

On Cayman Brac, there are two medium size hotels which cater to serious divers. The Buccaneer Inn is on the north shore and offers good reef diving directly off the hotel property as well as daily boat trips. The Brac Reef Hotel is on the south shore and faces a shallow lagoon and offshore barrier reef. Both hotels are close to the Brac Airport and the government dock for dive boat departures.

A brand new diver's hotel, Pirate's Point, has just been established on Little Cayman. It is a very small resort with only seven rooms, but is geared specifically toward diving. The new resort has an air compressor and a small dive boat.

TELEPHONE

Cayman has a modern automatic telephone system which enables visitors to call anyone on the island or make inter-island calls between the Brac and Grand Cayman. All Cayman Island phone numbers have five digits.

There is also excellent international telephone service between Cayman and the U.S. You can place a phone call from Cayman to the U.S., or worldwide for that matter, by dialing 15 or requesting the assistance of an overseas operator. From the U.S., you can now dial any phone in the Caymans direct by simply using area code 809 and the prefix 94 before the five digit Cayman phone number. In addition, telex and telegraph are also available in Cayman.

PHOTO SERVICES

Underwater photography is big business in Cayman and this island destination has an excellent set-up for providing underwater photo services. You can purchase all brands of photo equipment; rent underwater cameras, lenses and strobes; enroll in underwater photo classes; have your color slides processed overnight; or even have a photo of yourself taken underwater. Many of the diver hotels and dive operators offer underwater photo services, and there are

CAYMAN

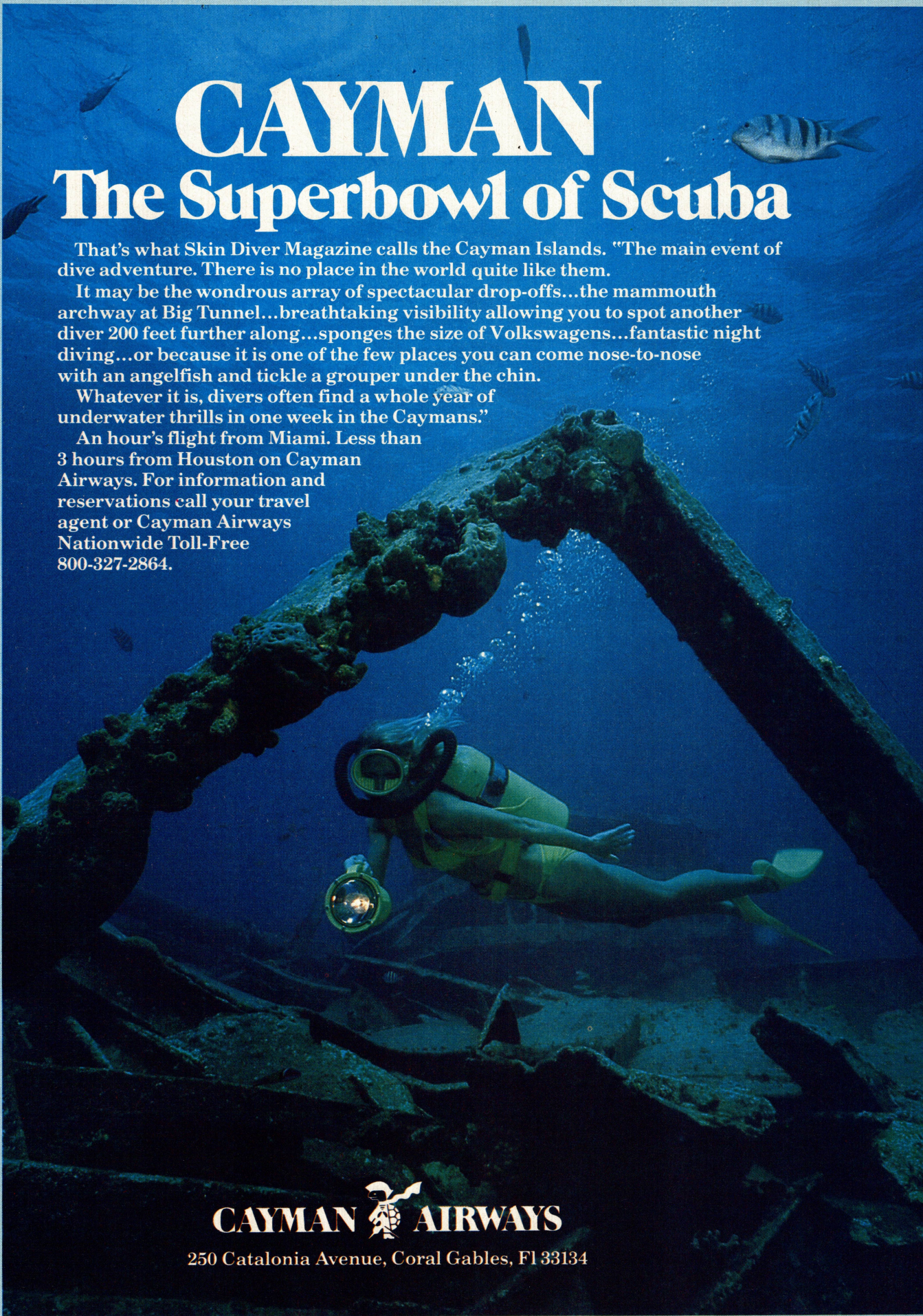
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no less than three different stores on Grand Cayman where you can purchase underwater photographic equipment and services.

Cayman Camera is an impressively well-stocked store that carries most major brands such as Nikon, Canon, Minolta, Pentax and Leica. The store also has a vast selection of lenses, light meters, strobes, camera bags and other accessories. The store offers 24 hour film processing and also sells a very nice set of underwater slides taken in Cayman waters. The store is located in George Town on the waterfront and the phone number is 9-5326.

Soto's Photos is a small but complete underwater photo center located at the Cayman Islander Hotel in the Seven Mile Beach area. This shop specializes in renting underwater cameras, teaching resort photo courses and offering E-6 color slide processing on a 24 hour basis. An automatic film processing machine is set up right in the back room. This shop also sells a limited selection of dive equipment and books dive trips aboard the Bob Soto dive boats. The phone number is 9-5533.

Undersea Photo Supply of Cayman is a combination dive shop and camera store. It is probably the best stocked dive shop in the Caribbean, and here you will find all of those little parts, accessories and specialty items that never seem obtainable back home. The store also stocks a full line of underwater photographic products including Nikon, Fuji, Cosina, Minolta, Ikelite, Oceanic, Subsea and so on. Its selection and inventory are overwhelming. The shop also offers 24 hour film processing, sells limited edition color prints and underwater color slide sets. The store is located at Selkirk Plaza in the Seven Mile Beach area. The phone number is 9-5522.

In addition to the three photographic stores, Cayman has two freelance underwater photographers who go out each day on the dive boats and photograph visiting divers underwater. Bonnie Charles of Photo Buddy (phone 9-3743) and Dickie Walls (phone 9-3910) do this type of work on virtually a full time basis, going out on a different dive boat every day of the week. The film is processed in the afternoon and shown to the dive guests the very same night. Divers who do not shoot pictures underwater have an opportunity to select and purchase color slides of themselves underwater, as well as slides of reefs they had visited earlier in the day.

DIVE OPERATORS

Divers visiting Cayman have a remarkable selection of dive operators from which to choose. At last count, there were a total of 22 operations providing dive trip services: 20 on Grand Cayman, one on the Brac and one on Little Cayman. These dive operators offer a wide variety

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SUNSET HOUSE

Sunset House is a divers' hotel designed for your every diving need and living comfort. It is located on the very edge of the blue Caribbean.



Underwater Photograph by Don Arneson

Hotel facilities include completely furnished apartments, air-conditioned rooms, complete dive shop on the premises, a newly constructed dining room and an informal thatch roof bar right on the waterfront where you can watch the Caribbean sun set upon a sparkling sea every night.

Large coral heads teeming with colorful fish abound less than 100 yards from the hotel pier. Shore dives are conveniently available every day and night dives can be made right from the hotel beaches. Several large dive boats lie at anchor directly in front of the hotel . . . waiting to carry you to nearby dropoffs, shipwrecks, coral reefs, and other exciting attractions.

The owners and staff of Sunset House are divers and they know how to make your visit an absolute joy. Generous home-cooked meals are served family style and the drinks are outstanding. Special arrangements can be made for dive groups, families, couples or individuals. Special half-week and full week divers packages are available upon request. Why not write to us and find out how you can make your next trip a real diving vacation.

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For complete information write airmail to:
Sunset House Resort, South Church St.
P.O. Box 479, GRAND CAYMAN, B.W.I.
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of services including: two tank morning trips, one tank afternoon trips, all day dive excursions, regularly scheduled night dives, snorkeling trips, special underwater photo trips, scuba instruction and beach dives. On Grand Cayman, 13 dive operators are located at resort hotels, six are independent operators serving all hotels, and one is a live-aboard dive cruise boat making a one week trip around the island. On the Brac, there is one independent dive operator serving both hotels. On Little Cayman, the dive operation is part of the resort hotel.

In Cayman, visitors have a unique advantage in being able to dive with a variety of different operators on different days. Arrangements can be made by simply telephoning the operator on the day prior to the scheduled trip and making a reservation. The following is a list of phone numbers which may assist you in making such dive trip arrangements:

Spanish Cove	9-3765
Surfside	9-2724
Peter Milburn	7-2189
Scuba Cayman	9-3873
Seasports	9-4430
Soto/Holiday Inn	9-4091
Soto's Photos	9-5533
Soto Beach Club	9-2023
F.L.A.G. Royal Palm	9-2636
Don Foster's	7-2426
Soto/Paradise Manor	9-2483
Soto Diving Ltd.	9-2483
Quabbin Divers	9-5597
F.L.A.G. U/W Services	9-2606
Sunset Divers	9-5966
Casa Bertmar	9-2514
Cayman Lodge	7-2483
Tortuga U/W Castle	7-2488
Cayman Kai	7-2573
Brac Aquatic	8-7257
Pirate's Point	9-5637
M/V Cayman Diver	9-2007

The dive services in Cayman are very Americanized. All of the up-to-date equipment is U.S. manufactured. Approximately two-thirds of the dive operations are owned or operated by Americans who moved to Cayman in order to pursue a career in diving. The remaining one-third of the dive operations are owned by Cayman-born divers who have either gone to school in the U.S. or received their scuba training and instructor certification in the U.S. As a group, the Cayman divemasters and instructors are considered to be the best in the Caribbean. They have all been trained in CPR, first aid, life saving and emergency recompression chamber procedures. They are extremely cooperative and frequently work together in emergency situations, communicating on VHF radio between dive boats and lending assistance at sea when it is needed.

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tion of identified dive sites in the Caribbean. This is because all three islands are completely encircled by drop-offs and coral reefs. The drop-offs are accessible to visiting divers owing to the proliferation of dive resort hotels and dive boat operators. The dive opportunities are absolutely vast and no two drop-offs are alike. Dive sites just 50 yards apart appear as entirely different reefs with different wall profiles and marine life. If there is one outstanding feature about Cayman diving, it is the variety.

Geographically speaking, there are four distinctly separate sides to Grand Cayman, and the choice of dive sites can often depend on certain conditions. If there is no wind, as often is the case during late spring and summer, diving can be done along any side of the island and the North Wall becomes a frequent and favorite choice. For the major part of the year, the prevailing winds are from the north or east. During these periods, the waters off the west side of the island, including Seven Mile Beach, are absolutely calm. These calm waters have contributed greatly to the rapid development of Seven Mile Beach as the perfect vacation spot. When the wind blows heavily from the north or northwest, most diving activity is shifted to the south coast or South Sound area. The east end is a little more choppy but the quality of the diving certainly makes the trip worthwhile.

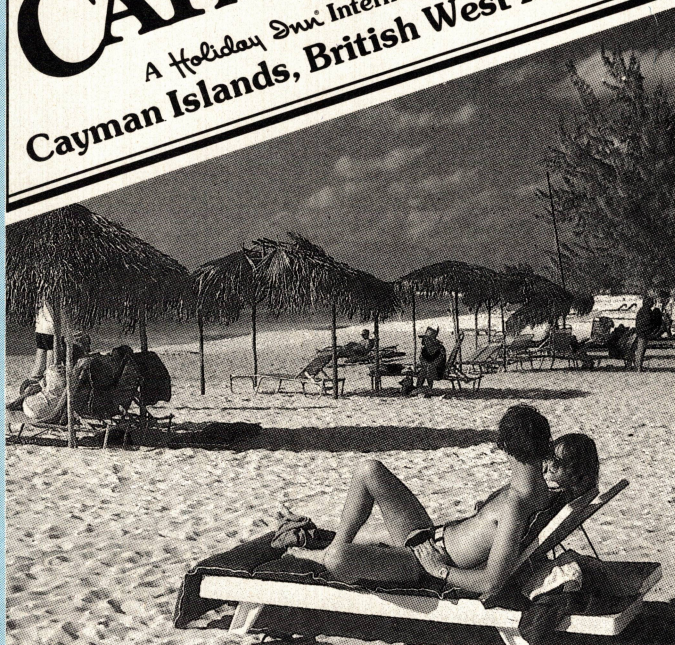
Cayman Brac and Little Cayman are long, thin islands which have only a north and south coast. On the Brac, diving is done along both the north and south coast where drop-offs and coral reefs abound. At Little Cayman, the best drop-offs are on the north side, but there is a good wreck off the south coast.

WALL DIVES

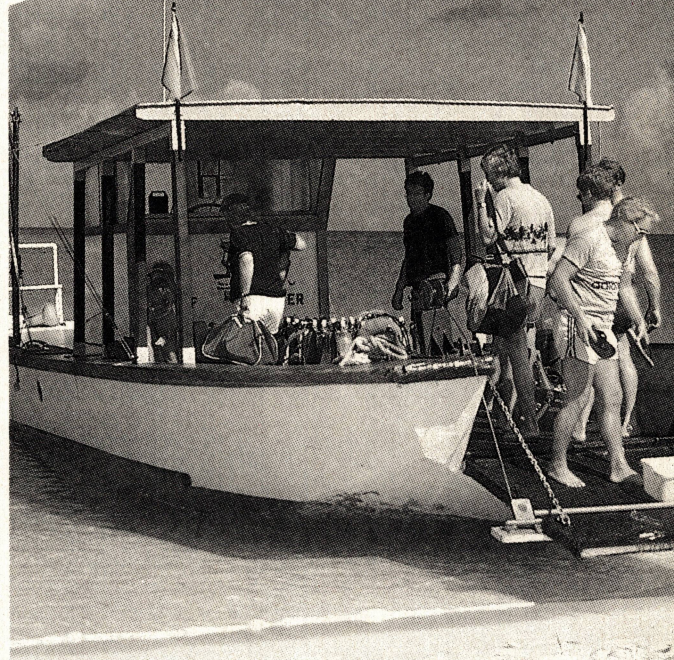
Among experienced divers who have traveled the Caribbean, Cayman is best known for its spectacular wall diving. These massive formations usually begin at depths of 50 to 70 feet and drop vertically into the abyss, 1000 feet below. Most of Cayman's walls are relatively close to shore, 200 to 300 yards off the beach. Some of the best known drop-offs in all the world are straight out from Seven Mile Beach, a 10 to 15 minute boat ride from the beach hotels. One of the most beautiful sites is **Trinity Caves**, a junction of three long narrow coral canyons that converge at the edge of a vertical wall and are loaded with black coral, tube sponges and dazzling marine life. **Big Tunnel** features a giant coral archway large enough to drive a semi-trailer truck through. **Orange Canyon** is an exceptionally beautiful drop-off with large barrel sponges and vertical canyon walls covered with orange sponge growth. **Big Dipper** is a drop-off marked by one of the largest basket sponges in the world, measuring six to seven feet across. **Sentinel Rock** is an extremely photogenic

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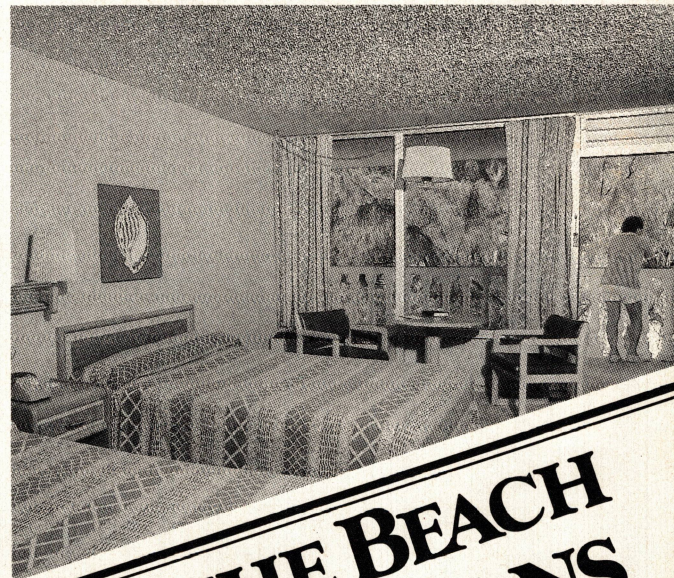
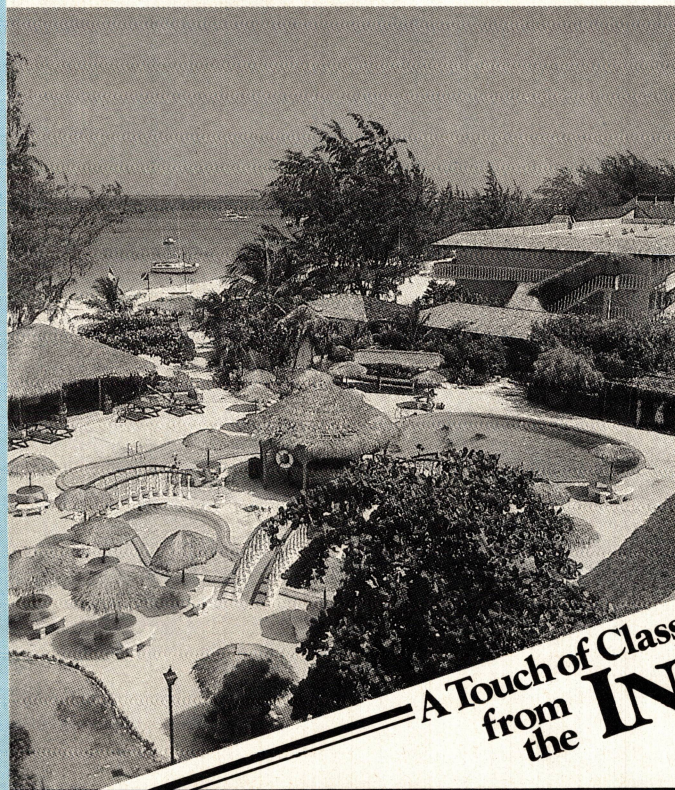
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drop-off with a high coral rampart, lovely tube sponges and giant gorgonian fans. **Sand Chute** is a wide coral canyon which features an absolutely giant barrel sponge, almost ten feet tall.

The North Wall of Grand Cayman is regarded by most island divers and dive-masters as the finest wall dive on the island. Its reputation for superb diving stems from the high voltage fish action and spectacular formations which exist there. While it can only be dived during calm weather at certain times of the year, the North Wall remains a favorite with many different sites. **Josh's Canyon** is a vertical face whose top edge is inhabited by a school of tarpon. These exciting fish are a rare sight for most divers, and a true challenge for underwater photographers. **Valley of the Rays** is a drop-off named for the giant stingrays who slumber in the sand canyon that leads to the edge of the wall. **Rafters** is another fish action location where divers are likely to see schools of jacks, big barracuda, and those elegant tarpon. **Gale's Mountain** is a massive coral formation perched on the very edge of a vertical wall, affording a breathtaking view.

The drop-off along South Sound begins at a slightly deeper depth of 80 feet, and provides an entirely different experience from the walls found off Seven Mile Beach. It seems as though everything is much bigger in size, including the stag-horn corals, gorgonian fans and other marine life. **Bonnie's Wall** is a spectacular drop-off with giant black gorgonian fans and large tube sponges. **Pinnacle Rock** is a unique coral formation, 35 feet in diameter, that rises 80 feet straight up from the base of a sand canyon that empties out over the wall. The formation is adorned with colorful sponges, sea fans and coral.

Grand Cayman's east end offers a tremendous variety of drop-off sites. These walls offer a combination of the large marine life seen along the South Sound and the fish life encountered on the North Wall. It is truly high voltage diving which should be pursued by experienced divers only. **River of Sand** is a huge ravine which empties over the wall like an undersea glacier. **Tunnel of Love** is another ravine which narrows into a coral tunnel that spills over the drop-off. **Cayman Canyons** is a spectacular drop-off that begins at 50 feet and is bordered by giant mounds of star coral. **Wall Ninety** is a unique drop-off formation, where the vertical face of the wall makes a sharp 90 degree turn. **Vertical Drop** is perhaps the steepest drop-off, featuring spectacular 200 foot visibility. **The Maze** is probably the most unusual drop-off, featuring a criss-crossing series of narrow coral canyons that wind and twist their way along the top edge of the drop-off.

Cayman Brac features wall diving along both its north and south shore. **Buccaneer Chute** is a sand ravine which empties over the drop-off. **Cemetery**

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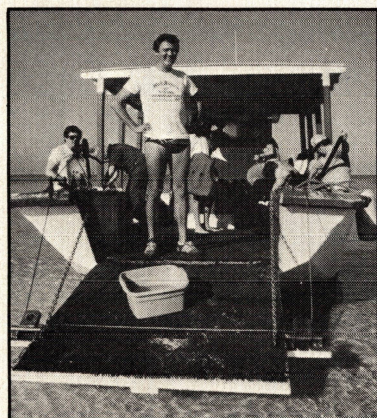
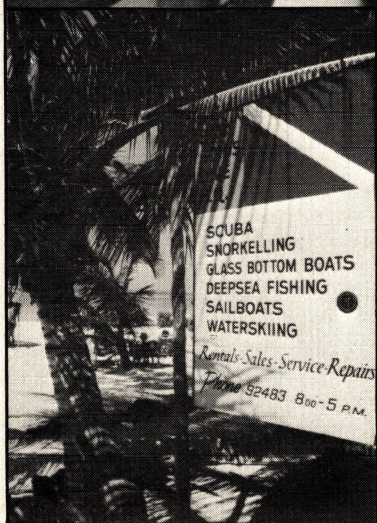
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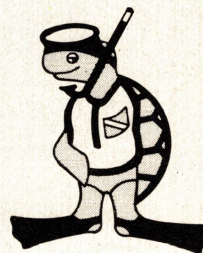
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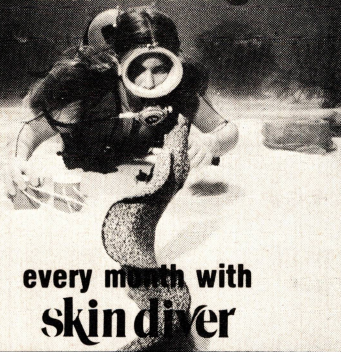
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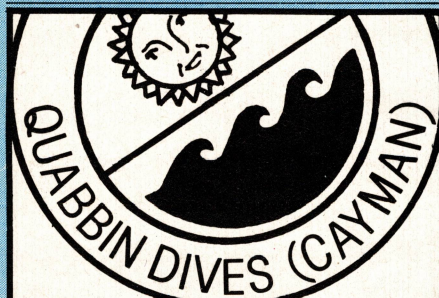
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Wall is a lovely drop-off featuring bright yellow sponges, basket sponges and azure vase sponges. **Anchor Canyon** is a wall which features a deep coral canyon in which a 100 year old anchor remains solidly fused to the coral. **The Hobbit** is an enchanting wall dive with strangely shaped sponges and a fairy-tale appearance. **South Wall** is another breathtaking drop-off with lovely sponge formations.

Most of the good wall diving sites at Little Cayman are concentrated along the north shore. **Jackson Point** is a marvelous series of coral canyons lined with exotic sponges, seafans and black coral. This spot is also inhabited by many fish. **Bloody Bay Wall** has been described as the most unique wall dive in the entire Caribbean. Beginning at an average depth of 22 feet, it is a sheer coral cliff which drops straight away to 900 feet. The vertical face of this wall features some of the most widely colored sponge formations one is likely to see. **Three Fathom Wall** is a small section of Bloody Bay where the top edge of the wall begins at the incredibly shallow depth of 18 feet. In addition to the sheer vertical nature of the drop-off, the top edge of this wall is a virtual coral garden.

WRECK DIVES

Cayman has a colorful history that includes shipwrecks and piracy. There are an estimated 500 ancient shipwrecks buried deep in the sands and coral reefs surrounding the Cayman Islands. However, there are only a handful of modern day wrecks which provide recreational diving opportunities for visiting sport divers.

The **Oro Verde** is the newest and by far the most popular shipwreck in Cayman. It was deliberately sunk off Seven Mile Beach in May, 1980, and has since become the island's greatest underwater tourist attraction. This vessel is 180 feet long and lies intact in 50 feet of water. The **Balboa** is perhaps the best known Cayman wreck. She was a 375 foot trader that sank during a hurricane in 1933. The hull was demolished for navigational reasons and the remains lie scattered over several acres of ocean bottom off George Town Harbour. In-shore from the wreck of the **Balboa** lies a small 200 foot freighter called **The Cali**. This wreck lies right up against shore in 8 to 25 feet of water and is frequently dived from the beach.

Off the east end, inside the barrier reef, lie the battered remains of two wrecks called the **Methuslan** and the **Maribell**. Both of these lie in 15 to 35 feet of water with their steel remains scattered among the coral formations. While there is little known about their history, they are believed to have been sailing vessels that were victims of severe storms.

At Cayman Brac, there is a century old shipwreck which lies ten miles east of the Brac Reef Hotel. Known as the **Prince**

Frederick, this combination sail/steamer is believed to have sunk in the 1860's. Four large anchors, two masts and a huge pile of anchor chain mark its location.

The wreck of the **Soto Trader** lies off the south shore of Little Cayman, and provides visitors with an opportunity to explore a totally intact island trader. This small freighter lies in 50 feet of water in an upright position with the stern against the reef.

CAVES AND TUNNELS

The warm, nutrient rich waters of Cayman encourage the rapid growth of coral. And in many cases, this fast growing coral becomes the architect for cave and tunnel formations. Reefs which began as ridges and crevices are soon transformed into a honeycomb of small rooms and passageways as the coral continues to grow over the top. A perfect example of these marvelous cave and tunnel formations is a reef known as **Eden Rock**. Here, a diver can spend the better part of a full tank, exploring one tunnel after another in only 50 feet of water. The caves and tunnels are very safe as there are a multitude of exits, as well as sunlight streaming through small holes and cracks in the coral ceiling above. **Kent's Caves** is a larger and much older system of tunnels and chambers which can take hours to fully explore. This intricate system of underground rooms features a good deal more fish life, including several large snappers and groupers. **Soto's Reef** is still another popular cave and tunnel complex in the George Town area of Grand Cayman. One of the most beautiful tunnel complexes is **Devil's Grotto**, especially so when the baitfish are schooling inside the caves.

At the east end of Grand Cayman there are numerous cave and tunnel formations worth exploration. **Cinderella's Castle** is perhaps the best known, but **Stag Party** and **Big Caves** are also very interesting. Two more that are frequently visited by east end dive guides are **Snapper Hole** and **Allen's Alley**. Most of these cave and tunnel complexes can be found in shallow depths ranging from 20 to 35 feet of water.

Cayman Brac has its share of cave and tunnel formations ranging in depth from 30 to 50 feet. These sites include such spots as: **Radar Reef**, **Duppy's Reef**, **Wind Sock**, and a dozen more. There is no shortage of cave and tunnel formations at either Cayman Brac or Little Cayman.

CORAL REEFS

When it comes to medium-depth diving, Cayman offers a vast array of coral reef formations. There are literally hundreds of such dive sites which are worth visiting. A favorite off Seven Mile Beach is **Aquarium**, where tame angelfish are hand fed on a daily basis. Nearby is the

equally popular **Peter's Reef**, named after a popular divemaster who has tamed just about every fish here. **Pipeline**, located off the Turtle Farm, is a very unusual reef formation and features an extremely unique sponge formation called Neptune's Throne. Still another remarkable sponge formation lies south of George Town and is called Armchair. This giant sponge is shaped like an overstuffed easy chair. **Sponge Point**, off Spanish Bay, is a lovely location for macro photography. Another great spot in the same area is **Cleaning Station**, which is loaded with arrowcrabs, Christmas tree worms and other invertebrates.

The east end of Grand Cayman has an even greater variety of shallow reefs, mostly inside the barrier reef line. **Ten Sails Reef** is a lovely coral garden, 15 to 30 feet deep. **Snapper Hole** is a 30 to 60 foot reef featuring schools of small snapper. **Grouper Grotto** is loaded with elk-horn coral and Nassau groupers. **Shark's Alley** is a coral reef best known for the two or three small sharks that patrol the area. **White Church Hall** is a large sand bowl surrounded by a lovely coral reef in 30 feet of water.

BEACH DIVES

One of the nicest things about Cayman is the fact that quite a number of sites can be reached from the beach or ironshore. This allows the hardcore divers to get in extra dives before and after the regularly scheduled boat trips. Such beach dives are particularly conven-

ient if you happen to be staying at a resort hotel which has a reef directly in front of the property. One of the most interesting beach dives on Grand Cayman is the **Casa Bertmar Reef** directly out from the Casa Bertmar Hotel. The depth of this reef ranges from 30 to 50 feet and the area is loaded with coral formations, fans, sponges and tame reef fish that can be photographed at fairly close ranges. The reef is also loaded with invertebrates that are ideal for macro photography.

Sunset Reef is a similar coral reef formation directly in front of the Sunset House. It is a popular afternoon ironshore dive as well as a great spot for night dives. **Spanish Bay Reef**, directly out from Spanish Cove Resort, is a lovely dive site that features a small mini-wall and a healthy coral reef for photography. **Lodge Lagoon** is a five to eight foot deep coral garden in front of the Cayman Diving Lodge. This shore dive is particularly good at night as the area is loaded with invertebrates: octopus, squid, lobsters and morays.

ELECTRICITY

Underwater photographers and night diving fans will find Cayman electricity compatible with their recharging equipment. The standard electrical power on Cayman is 110 volt AC at 60 cycles. Divers can recharge their ni-cad powered strobes and underwater handlights right in their hotel room, as electrical outlets are standard U.S. type. >

MORE INFORMATION

If you would like more information about the Cayman Islands, and especially about hotel accommodations, sightseeing opportunities, freeport shopping bargains, restaurants, nightly entertainment and other such facts, you can obtain it by writing to the Cayman Islands Department of Tourism. There are five offices in North America:

Cayman Islands Tourism
250 Catalonia Ave., Suite 604
Coral Gables, FL 33134
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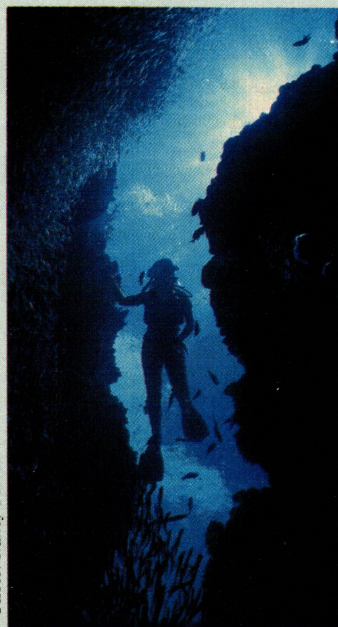


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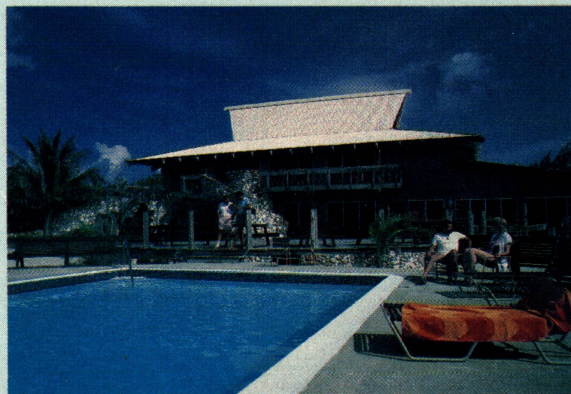


Photo: Nancy Sefton

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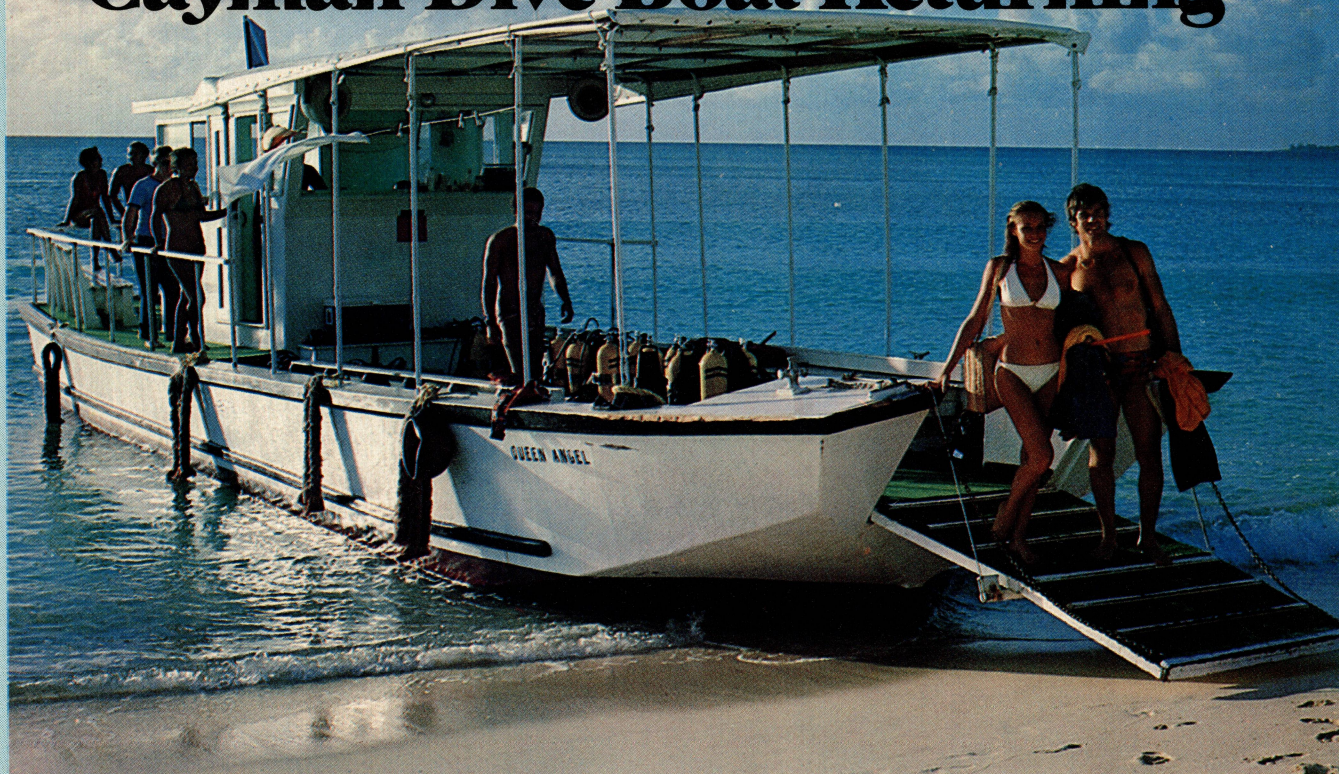
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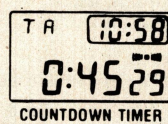
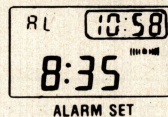
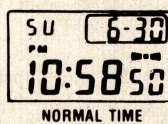
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unique display which shows time in every mode, electronic calendar, daily alarm, time signal, countdown alarm, night light and a 1-hour repeating stopwatch.

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E. LADIES FASHION AFLOAT.

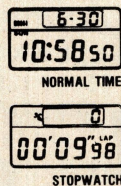
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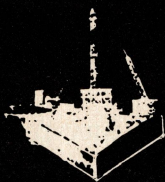
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DIT STUDENT INCREASE

Divers Institute of Technology, Inc. (DIT) in Seattle, Washington has reported that new enrollments (which started in August and September of 1980) hit record highs. The school now has 124 full-time students in six separate classes. In order to accommodate them, DIT has another new classroom and two new offices under construction.

DIT's curriculum has been designed to prepare students for gainful employment in all fields of commercial diving. "We just can't turn out our graduates fast enough," president John Manlove says. Manlove states that the last three classes (a new class convenes each month) were filled to capacity.

For further information, write to Divers Institute of Technology, Inc., P.O. Box 70312, Seattle, WA 98107. ✉

DIVER'S HANDBOOK

Wayne C. Tucker's new book, *Diver's Handbook of Underwater Calculations*, has proven invaluable to commercial divers, underwater scientists and serious scuba divers.

The book, released last year by Cornell Maritime Press, is one of the most complete and comprehensive underwater technology books to date. Tucker, one of the 15 full time instructors at Commercial Diving Center, Los Angeles Harbor, wrote the book because of the, "sea of useful information between diver and engineer which has never been deciphered."

"Wayne Tucker's background makes him a valuable part of CDC's faculty," stated CDC's executive director, Jim Joiner, "and his book is a natural addition to our school bookstore and library. Although it isn't a required text for the course, almost without exception our students opt to purchase it during their training here." ✉

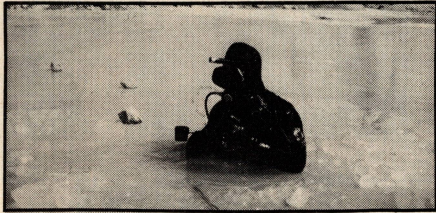
HYPERBARIC AND UNDERSEA MEDICINE TEXT

Medical Seminars, Inc. has now made *Hyperbaric & Undersea Medicine* available to everyone in the diving field. This valuable and up-to-date reference (Vol. 1) is composed of 40 articles, each authored by a recognized authority on undersea medicine and safety. Each of the 40 sections explores a different facet of diving medicine and each contains a list of references and study questions. The answers to the study questions in this volume are contained in an answer key.

For further information contact: Medical Seminars, Inc., 11406 Whisper Moss, San Antonio, Texas 78230. ✉

HIGHEST DIVE

Larry McBride of Westminster, Colorado completed a dive in June which he believes is the world high altitude submersion record. Diving in a tiny lake at 16,995 feet above sea level in western Bolivia, McBride spent about five min-



utes at a depth of less than three feet. The dive was accomplished under five inch thick ice and McBride barely had room to move between the ice and the shallow lake bottom.

The dive was witnessed by McBride's guide, Ronnie Ibatia. McBride is awaiting official documents from Bolivia before he registers for the world record with Guinness Superlatives, Ltd., the keeper of such records. 🐟

AUDIO/VISUAL PROGRAMS

Educational Images of Lyons Falls, New York offers three dive-related filmstrips — *Salvaging Spanish Treasure*; *Finding Florida's Ice Age Man*; and *Man: 12,000 Years Under the Sea*. All three series come with audio tapes and extensive printed texts. The filmstrips have been developed with the assistance of experts in the various fields to form completely comprehensive programs.

For information on these and other programs, contact Educational Images, P.O. Box 367, Lyons Falls, New York 13368; telephone (315) 348-8211. 🐟

WET EASTER EGG HUNT

An underwater Easter egg hunt co-sponsored by the Sparks Recreation Dept. and Mountain Lakes Diving Center will be held on Saturday, April 17, at Sand Harbor, Lake Tahoe. Food and beverages will be served and prizes will be awarded. The cost is \$8 when pre-registered and \$10 for entry on the day of the event. Registration will be held from March 1 to April 5.

For information contact: City of Sparks, Recreation Department, 98 Richards Way, Sparks, Nev. 89431. 🐟

GREAT LAKES FESTIVAL

The fifth annual Great Lakes Shipwreck Festival, sponsored by the Ford Seahorses Scuba Diving Club, will be held on Saturday evening, March 6, in Dearborn, Michigan. The event will consist of several Great Lakes underwater shipwreck films presented by well-known Midwest dive community personalities. Admission is \$6. For information contact Chairman Chuck Feltner, 166 S. Lafayette, Dearborn, MI 48124. 🐟

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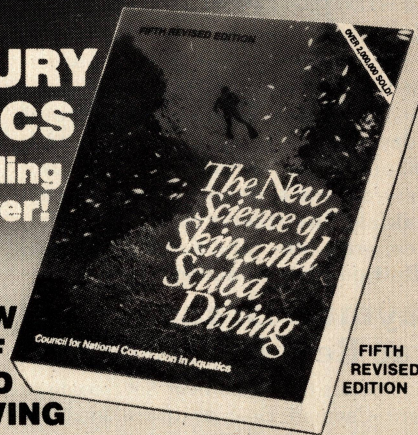
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Yucatan Chac Mool \$399

A refreshing change of pace awaits you at Chac Mool. The intimate retreat, amidst a lush green coconut grove, stretches out to a pure white sandy beach. Live in native "palapas," and enjoy delicious local fruits and vegetables, native breads and fresh seafood. The diving is excellent, with precipitous drop offs, sheltered lagoons and cenotes, all nurtured in one of the world's two great barrier reefs. **Includes: five nights accommodations, five 2/tank boat dives, one night dive, three meals daily, two side trips to Coba, Tulum, or Xel-Ha, transfers, taxes and gratuities.**

Roatan Roatan Lodge \$580

The waters, protected by the third largest barrier reef in the world, supply an underwater wonderland of unsurpassed beauty. The variety of diving encompasses coral heads and grottos, reverse ledges, 100 ft. walls, caves, canyons, sponge gardens and the oldest wreck in the Americas. **Includes: seven nights accommodations, two dives daily, night dive, three meals daily, unlimited use of Sunfish sailboats, government tax and service charge.**

Turks & Caicos Pine Cay \$650

A beach-fringed private island cooled by tradewinds; unexplored dive sites team with marine life in a clear-water preserve. Luxurious beachfront suites, exquisite cuisine, friendly atmosphere, pool, tennis and magnificent diving. **Includes: Seven nights accommodations, six guided reef trips, three meals daily, on-island transportation, transfers, taxes and gratuities.**

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By Amy Brown

Even the most critical of island hopping divers will take notice of Pine Cay, providing they are resourceful enough to explore beyond the more visible islands of Grand Turk and Caicos. Tucked away in the island chain, Pine Cay has blue waters, white sand, soothing sunshine and a relaxing indolence that make it an idyllic retreat. The twelve room Meridian Club is the hub of this 800 acre privately owned resort community, which is two miles long and at most, a mile wide. What sets Pine Cay apart from the rest of the islands are the dynamic Bill and Ginny Cowles and their colleagues, working harmoniously in tandem with West Indian nature, creating a haven of genial and gracious ambience for the enjoyment of life's simpler pleasures.

The unpretentious clubhouse sports a spacious drawing room, hand rubbed bar and veranda. Rooms are large and comfortable. The superb meals are a credit to the culinary talents of Ginny Cowles, who has over the years patiently forged a skillful kitchen staff and courteous team of waiters. Meals are served family style in a lower level dining room. No cars are permitted on the island, transportation is via electric golf cart.

Ilene and Gary Adkison are the knowledgeable and enthusiastic directors of the dive operation, under the auspices of the non-profit research foundation, PRIDE. Exhilarating wall dives, blue holes, virgin reefs, mammoth caves and canyons are all within easy access of the full service dive facility.

A dive vacation spent on Pine Cay is most aptly described as a return to the West Indian Walden Pond. The philosophy of islanders is best summed up by Bill Cowles, "Our basic aspiration is to be as self-sufficient as practicable, to provide the simple necessities and amenities to guests without destroying the healthy and benign environment of the cay."

Air Florida has daily service to Grand Turk from Miami. Prompt connections are available to Pine Cay via Turks and Caicos International Airlines. **Air and land arrangements handled through OceanQuest. Call toll free 800/526-1394 or 201/744-5254 for immediate reservations and information.**

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SDM travel

SECTION

For years I'd heard from friends and fellow divers about the great laid back atmosphere and super diving to be found near Guaymas and neighboring San Carlos, Mexico. Situated on the eastern shore of the Sea of Cortez, the historic fishing port of Guaymas has long been a mecca for West Coast spearfishermen after the big ones. And now, comments such as "the best shell collecting," "huge groupers," "spectacular sunsets," and "delicious Guaymas shrimp" — along with an offer of lodgings in a romantic cottage by the sea — finally made a trip to Guaymas irresistible.

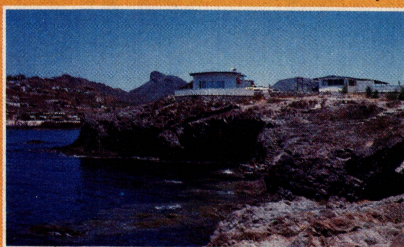
The underwater environment of the Sea of Cortez consists of a rare mixture of tropical and subtropical species of plants and animals. For someone as high on California diving as I am, the Sea of Cortez proved to be a real attitude adjuster.

It was as if someone had taken the largest and most colorful tropical fish and planted them in a glorious undersea garden. California divers (myself included) constantly rave about our magnificent kelp forests. But the numerous varieties of brown, red and green algae which thrive in the Sea of Cortez are incredible to behold. The fish are so numerous and so diverse, scientists are still counting and cataloging.

As for the crawling critters, the nudibranchs here are simply beyond description. I gazed wide-eyed at some of the most beautiful creatures I'd ever seen on land or underwater. But, of all underwater endeavors in the Guaymas/San Carlos area, shell collecting is perhaps the biggest attraction of all. Avid collectors from around the world come here to search for valuable cones, murexes, and cowries; for these waters support some of the most diverse species found anywhere. (The Sea of Cortez is not only one of the richest oceanic prov-



photos/Beverly Dalby



photo/Karen Straus

GUAYMAS, MEXICO A Peaceful Refuge

By Beverly Dalby

inces in the number of individuals but also in the number of species.)

The best diving in the area is found along the Bay of San Carlos, about 10 miles northwest of Guaymas. Dive sites from south San Carlos all the way up to San Pedro Point are almost too numerous to count. With a four wheel drive vehicle and an inflatable boat you can explore to your heart's content. Several excellent dive sites can also be reached via short swims from the beach. A few of the most notable spots are:

Shangri-La Point — Descending a concrete stairway next to bungalow #117 at the Shangri-La Beach Cottage and Trailer Court, divers can make an easy rocky entry into a protected cove. Diving to the left around the point is excellent. Snorkeling is good throughout.

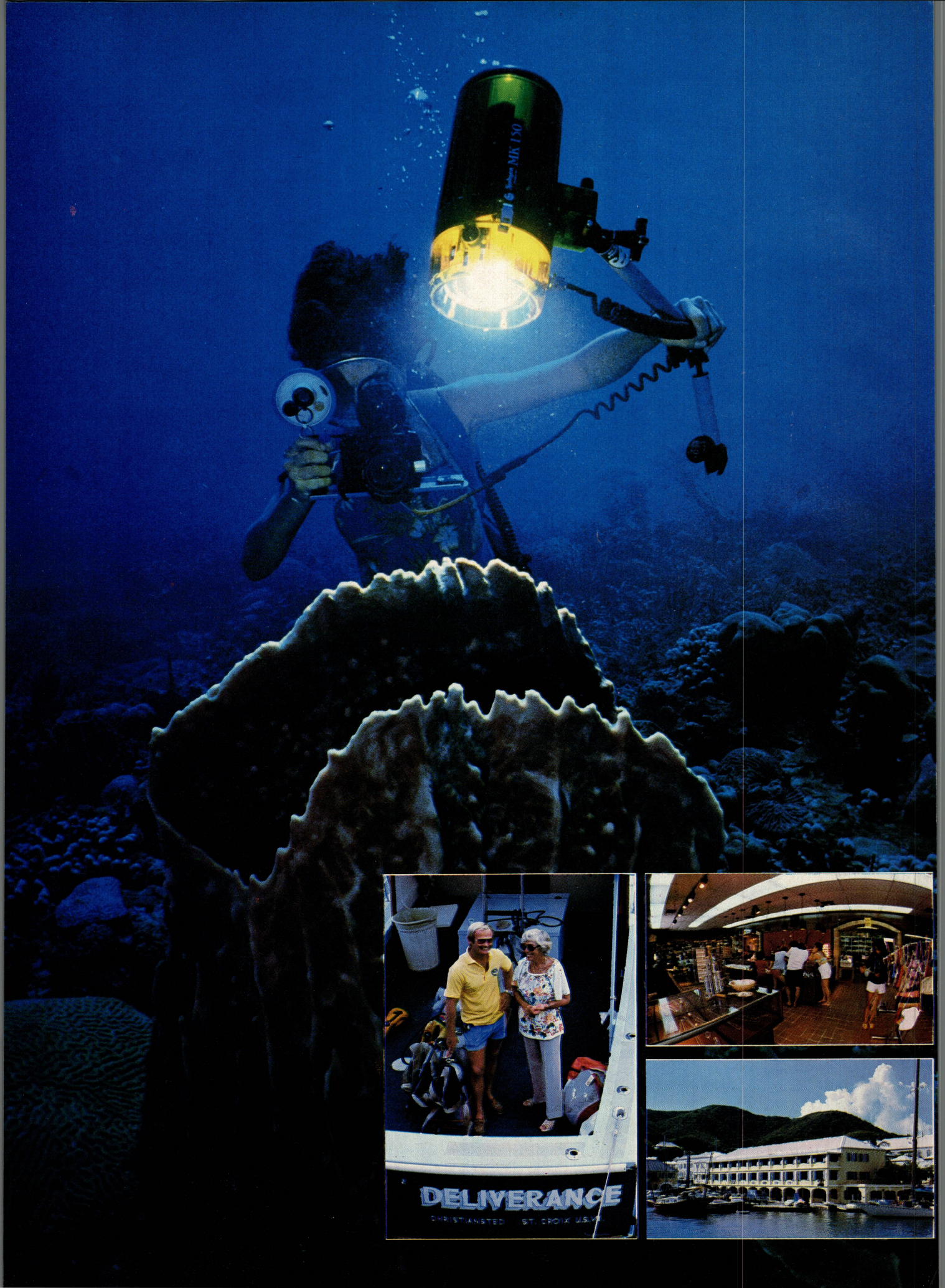
San Miguel Island — For those up for an energetic kick, this small island is located about one-half mile from the

Shangri-La steps. Diving here is outstanding. It's a field day for shell collectors and underwater photographers. (Beware of small boat traffic on your way out. A dive flag is highly recommended.) Launching a small boat or inflatable from the beach just below the trailer court is generally the preferred method of access.

Catalina Island — Located just outside the San Carlos Yacht Harbor, this is a large rock which offers extremely colorful diving. It's a good spot for shell collecting and swimming with sea turtles and is also excellent for snorkeling. Launch an inflatable at Shangri-La beach and head north.

Lalo Cove — Located about four miles from the center of San Carlos village, Lalo Beach is well protected and offers good diving all along the cove and out to the small island (Lalo Island) just offshore. Huge numbers of fish, from large groupers to colorful gobies, reside here. Drive north

(Continued on Page 119)



Remember how the Dustin Hoffman character in *The Graduate* was cornered at poolside by the obnoxious capitalist proclaiming the future in a word — “plastics?” In a similar fashion my memories of St. Croix keep reverting to a single word also — “pastels.” The word is a distillation of a myriad of images. It is the early morning fog shrouding Christiansted Harbor with the many boats rocking gently at anchor. It’s the lush greens of the dense foliage in the hills above Frederiksted. It’s the pink, yellow, gray and turquoise of the quaint historic structures dotting the island. But, most notably, it is the rainbow of color which accompanies the underwater experience. Here, the blue of a clear Caribbean sea combines with the soft lavender of the seafan and the reds, yellows, browns and oranges of an immense variety of sponges to provide the background for Nature’s champion of coloration, the tropical fish. In St. Croix, adventure does not necessarily begin and end in the ocean, but certainly the coral reef will be the highlight of any diver’s vacation.

More than 60,000 people per year visit St. Croix’s Buck Island. Administered by the Department of the Interior for snorkelers only, the Underwater Trail there is a unique concept and has introduced countless people to their first underwater experience. However, there are some exceptionally beautiful coral gardens around Buck Island where scuba diving is permitted. In fact, one of the most memorable dives of my most recent trip

to St. Croix occurred at Buck Island, as Larry Angus led us through a maze of high profile coral heads into a small underwater valley full of glass minnows. The light was fading in the late afternoon, but I still have a vivid memory of these schools separating and reforming as Larry and underwater model Janette Weeks swam about positioning themselves for photographs.

However, as nice as Buck Island is, it is only a very small part of the varied diving to be found off St. Croix. And divers who commit to the King Christian Hotel/Caribbean Sea Adventures package have the ideal opportunity to fully sample the diversity of the diving here. Of course, weather conditions and visibility can alter any specific plans, but the following reefs are popular dive spots:

Salt River Drop-Off — The slope here begins at about 50 feet where the bottom consists primarily of large seaweeds and barrel sponges and becomes more precipitous at about 85 feet. Black coral may be found as shallow as 100 feet and giant specimens of orange elephant ear and yellow and purple tube sponges are common. The marine life we saw along the wall included amberjack, soldierfish, squirrelfish, angelfish and even a sea turtle.

Cane Bay Wall — This is one of the longer runs by boat, approximately nine miles west of the Christiansted Harbor, but the drop-off makes the trip worthwhile. Cane Bay is more vertical than Salt River and my primary memories of this

area are colorful sponges and gorgonians, excellent visibility, and interesting pelagics cruising the face of the wall.

Gentle Winds — Named after the adjacent resort, Gentle Winds is a shallow reef with some fine diving in 30 to 45 feet of water. We saw lots of triggerfish and black surgeon as well as other typical Caribbean species. There is a tremendous variety of sponges and corals and several interesting formations where an encrusting sponge has grown along the underside of a coral head.

Green Cay Slope — East of Christiansted Harbor and approximately halfway to Buck Island, depths in this area range from 40 to 110 feet. The slope is approximately 45 degrees. This is a good area to see stingrays; Larry claims to have seen as many as eight on one dive. Large barrel and tube sponges are common and garden eels can generally be observed. Among the other reef residents typically found in the area are pufferfish, moray eels, squirrelfish, bigeyes and angelfish.

The Stacks — This is another relatively shallow dive with depths ranging from 40 to 60 feet. One of the highlights of this dive is a friendly queen triggerfish that Larry has been feeding for several years. Consequently, as soon as the anchor is placed the fish approaches for his hand-out. The coral is generally low profile but varied. Star, pillar, brain, elkhorn and staghorn corals are commonly found in this area.

The Frederiksted Pier — This is one of the premier night dives in the Caribbean. I had heard about Frederiksted Pier for several years but none of the raves really prepared me for the explosion of color concentrated on every piling. What we have here is a 1000 foot long commercial pier supported by more than 500 concrete pilings. Each of these is more or less covered with encrusting sponges and further adorned with tube sponges. There is no pattern to this encrustation, it is just pure, saturated color. I could have done without the old tires, beer cans and fishing line scattered about the bottom; but the marvel of the marine microcosm comprising each piling makes the dive tremendously valid. Seahorses are the standard by which locals gauge the success of their Frederiksted Pier dive. Apparently the seahorse was very common on the pier at one time, but Hurricane David wiped out most of the population. Now they are making a comeback and those who know where to look see one on nearly every dive. Other species likely to be seen on a night dive include octopus, scorpionfish, batfish, flying gurnard, arrowcrab, anemone, banded coral shrimp, sharp nosed pufferfish, frogfish and lobster. Within the scuba package there is an option of exchanging one two-tank dive for a night dive on the pier. Take advantage of the option, it is really a

(Continued on Page 120)

St. Croix Scuba Bargain

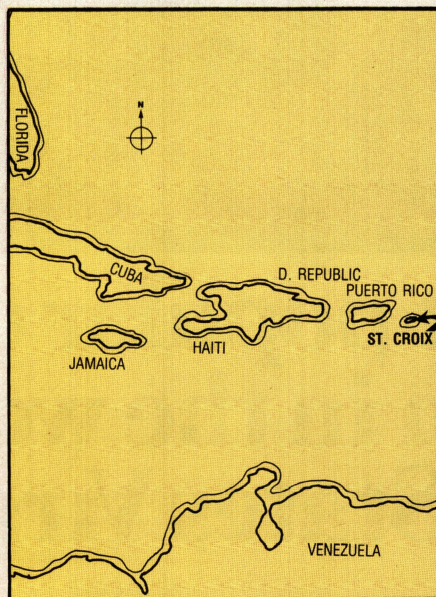
King Christian Hotel combines with Caribbean Sea Adventures for an attractive vacation package

Text and Photography by Stephen Frink



photo/courtesy Eastern Airlines

Above, Eastern Airlines flies 727 Whispermists to St. Croix. Right, the island of St. Croix rests in the Caribbean, just east of Puerto Rico. Opposite, Jan Weeks photographs a huge barrel sponge. Insets: Larry Angus, operator of Caribbean Sea Adventures, and Betty Sperber, owner of the King Christian Hotel; Shopping in Christiansted; and King Christian Hotel.





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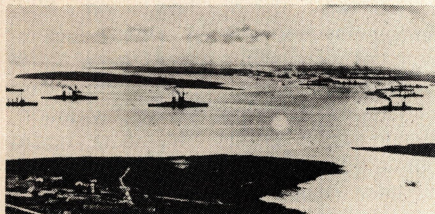
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Write for our 24-page “Dive Guide.” United States Virgin Islands Division of Tourism, P.O. Box 471269, Miami, FL 33147.

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Diving the wrecks of Scapa Flow off the Orkney Islands in Northern Scotland is now offered in a one week scuba package. Trips for the summer season are available to view the 30 sunken ships of the German High Seas Fleet which were scuttled after World War I. Battleships, cruisers and more lie in an average of 70 feet of water. Divers will have up to three



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There will be departures July 31 and August 7, with additional trips on request. Special group rates are available. For further information contact Trans Atlantic Diving at Atlas Leisure, Inc., 15 West 44th Street, New York, NY 10036; phone (212) 997-1290.

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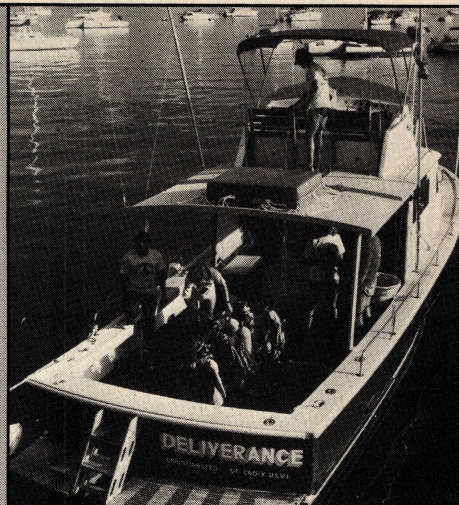
See & Sea Travel, in cooperation with Texas Christian University, is sponsoring a summer travel course among some of the primitive islands of the Philippines, on board the 102 foot diving cruiser, the *Sequester*.

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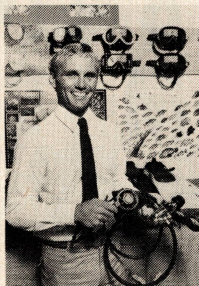
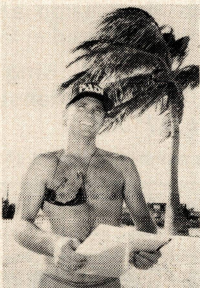
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The two cruising hotels are *M.V. Auriga Bay* and *T.S.M.V. Reef Explorer*. Both vessels operate out of Cairns, North Queensland. Each cruiser is equipped with the most modern diving, navigational and safety equipment, an on-board bar, air-conditioning, and two showers.

These cruise holiday packages commence and terminate with transfer from and to Cairns Airport, and do not include round trip air travel via Qantas' Queensland service from Los Angeles or San Francisco to Townsville, or the modest charge from Townsville to Cairns Airport.

Scheduled departures to the outer Great Barrier Reef on board the dive boats, *M.V. Auriga Bay* and *T.S.M.V. Reef Explorer* are:

Auriga Bay, May 18-28, May 31-June 8, Aug. 24-Sept. 3, Oct. 26-Nov. 5, Nov. 23-Dec. 3.

Reef Explorer, April 14-26, June 22-July 4, Dec. 18-30.

For further information on prices and dates of both charters and scheduled departures contact David Loughnan: Dive in Australia, P.O. Box 1111, North Sydney 2060, N.S.W., Australia; or telephone, 922-3701.

Qantas' 30 day advance purchase excursion fare from Los Angeles or San Francisco to Townsville ranges from \$390 one-way (low season) to \$625 one-way (peak season).

Departures from Los Angeles International Airport are every Saturday at 8:45 pm, with a stop in Honolulu. Departures from San Francisco International Airport are every Saturday at 9:00 pm, connecting in Honolulu with the Los Angeles flights to Townsville.

In addition, Qantas provides service from the West Coast cities of Vancouver, San Francisco and Los Angeles to Australia on a daily basis via Honolulu.

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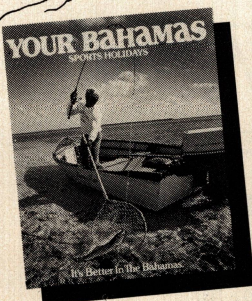
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See the September '81 issue of *Skin Diver* for the "Best of The Bahamas."

FEAR FACTOR

photo/Robert Ledbetter



BY HENRY JAMES BUTLER

Let's talk, just the two of us. Let's talk about fear.

It was only my second dive on the wreck, the first having been one of those round 'em up, follow-the-leader, by-the-number dives cautious dive shops tend to run whenever a questionable group descends upon them. I couldn't blame them, the wreck was a good 90 feet

down in a steady five knot current a half mile off the east coast of Florida. If a diver had come up wide of the tag line, his next stop would have been Bermuda.

We must have conned the captain pretty well. The second day he allowed us to dive in buddy teams — no big thing unless you knew we hardly had enough

bottom time among us to have washed the chlorine out of a fair-sized wetsuit.

I teamed up with Nick — the only one there with a C-card more than six months old — and promptly surrendered to his expertise. "I know this wreck like the back of my hand," he'd been telling us ever since we'd left home. He made a big deal of the fact his check-out dives had been made on this wreck — as opposed to our quick dips in the springs of northern Florida. "I know every rivet on the thing," he would smile whenever he said it. I was glad he was my buddy.

As I struggled to get the tank straps right on my shoulders, I found myself silently thanking Harry — another member of our group — for talking me out of wearing the doubles I'd worn the day before for air insurance. Although the Navy tables had sent me up with well over half my air, I had been thinking of diving with them again, just to be safe. Harry was a bright, quiet, easy going fella who could be persuasive as hell when he wanted to be and for some reason he'd wanted to be persuasive about those doubles the night before. I still wasn't sure how he'd talked me out of it, but I nodded my thanks as I took hold of the rope attached to the anchor line and fell as gracefully as I could into the sea.

The descent was one of those flapping-flag-on-a-flagpole affairs that leaves your arms feeling like a length of



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overcooked linguini. I barely had time to massage the feeling back into my fingers before Nick was beside me at the anchor where we were partially sheltered by the looming bulk of the wreck. He impatiently motioned me to follow. I tried to talk with him before moving on, using the hand signs I'd insisted we go over before the dive. He ignored me, taking off for the wreck without a second look in my direction.

I followed him on a short leash, expecting a nice leisurely tour of the upper deck as he headed for the upper forecastle. Then, suddenly, he piked over into a rusted hatchway and headed down deep amidships.

I pulled up short and stared after his fading dive light, half a hundred things running through my mind in the brief seconds I stayed there. Foremost in my mind was fear — fear of death, fear of the dark, fear of what might be waiting down there for me; but most of all I was afraid of the fear, afraid I would show it. I would have liked to have trailed something behind me to show the way out — line, twine, bread crumbs, anything — but Nick's light was fading fast, and there was nothing at hand. So, with the false bravado born of too many Sea Hunt reruns, I quickly kicked over and headed down to catch my buddy.

The light leveled off and disappeared toward the stern before I could catch up. He had headed off into some sort of

utility crawlway that ran the length of the ship's keel. Twelve by 18 inch hatchways were the only way through the watertight bulkheads that came every ten feet or so. My buddy was squeezing through the second bulkhead, a faint whisp of silt rising from his fins into the chamber between us as I watched him. I reached for the edge of the portal — hoping the two inches and 40 pounds I had over Nick wouldn't wedge me in tight — and followed.

We kept going that way, with him staying one bulkhead ahead of me. He must have had clear water ahead of him, but each chamber I passed through carried that milky look of an over chlorinated pool. I could never get close enough to stop him, to signal him I was scared to death and wanted back out — and I'm not really sure I would have if I could. I had long since put my trust in his ability to get us out, believing he knew what he was doing, assuming he would never have willingly led me into danger. I kept assuming that right up to the point when he stopped at the hatchway half blocked by the deck above, turned quickly to look at me, and the silt hit us.

If hell is a darkness, lifeless and black, then I was there that day. My first thought — an instinct born of repeated drill — was to check my air. I pulled the gauge up flush to my mask, trying to read it by the luminous dial. I couldn't

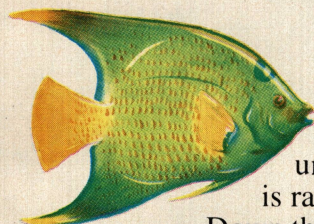
see it. I couldn't even see the faintest green glow for all the silt suspended in the quarter-inch of water between my facemask and the dial. It was then I knew I was going to die.

I felt the ripple of a wake pass by, and I reached out and grabbed a fist full of fin. A couple of seconds jockeying about and we were both kneeling on the metal plating, fighting to control our breathing, to avoid panic. I still thought he would lead us out somehow, that he had some sort of trick up his wetsuit sleeve that would get us out safe and alive. The fact he was chewing up his air as hard and fast as I was somehow told me nothing.

I used hand signals to ask him to lead me out, using my fingers to feed the message into his hand. It took two tries before he got the message, and then he shook it off, motioning for me to take the lead. If there are a hundred painful ways to die, I wished them all on him that moment. Here was the guy who knew this wreck inside out telling me to lead him — and I barely knew which way was up, much less out. I tried to puzzle it out, but all that came to my mind was the memory of a man lost in an underwater cave who stopped to write a note to his wife before dying. I didn't know what to do, but of one thing I was certain, there would be no such notes from me. One way or the other, I'd go out trying.

(Continued on Page 116)

FAMOUS WATER COLORS.

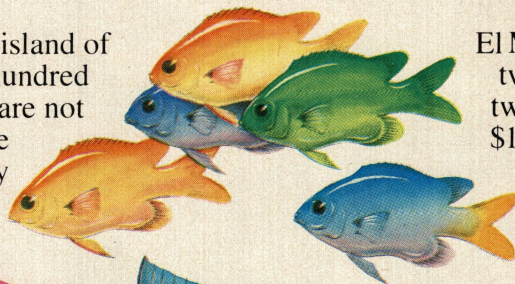


Off the Mexican island of Cozumel, one hundred foot visibilities are not unusual. And the underwater scenery is rainbow colorful.

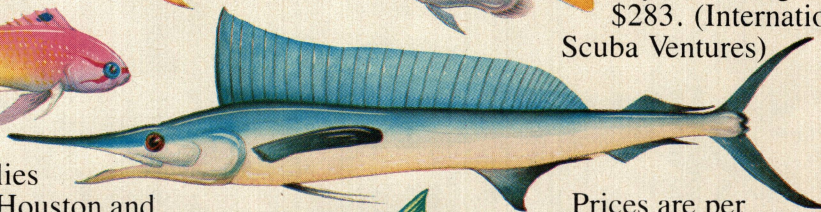
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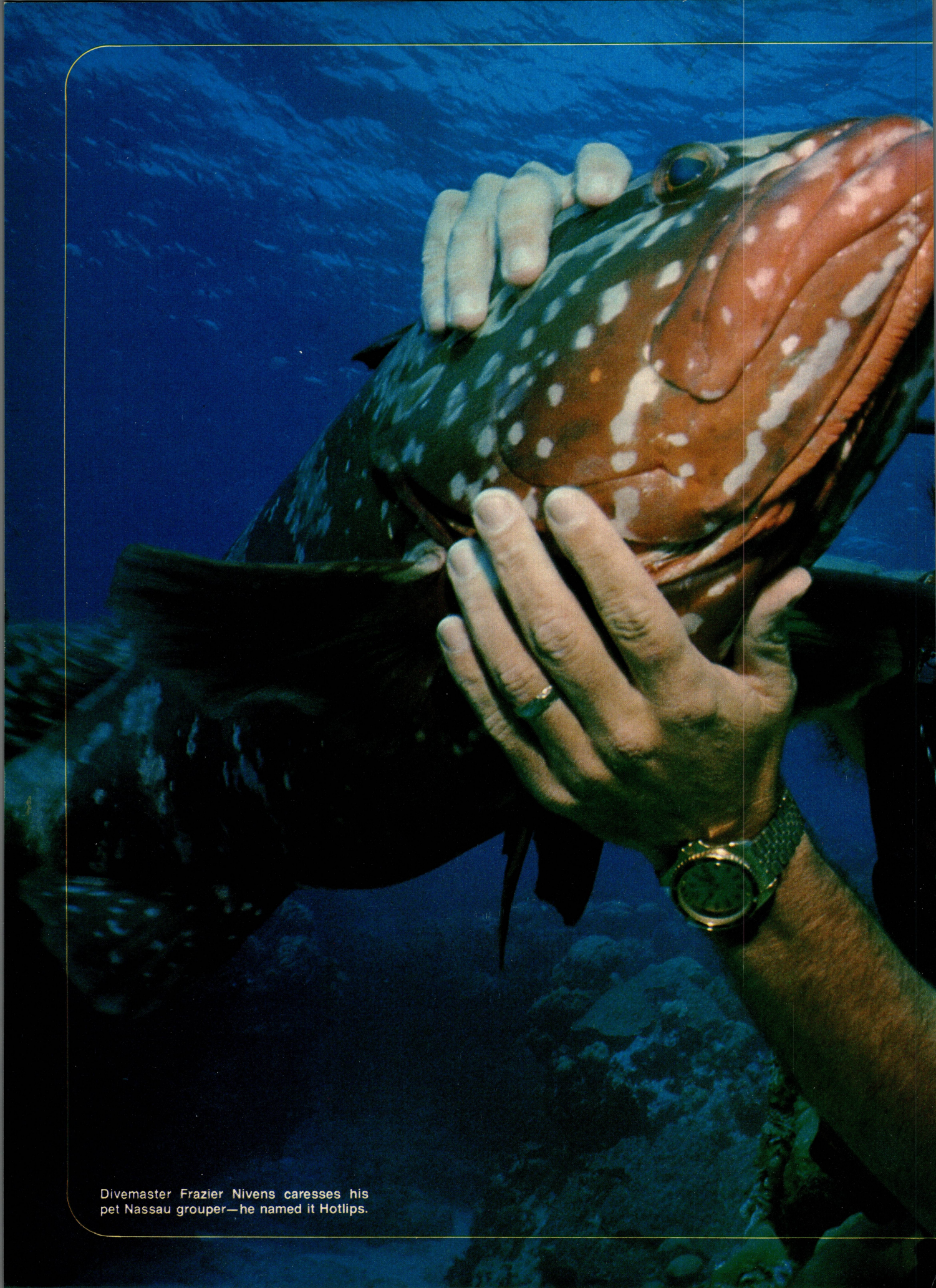
El Marques Hotel, with two days of diving, two tanks per day from \$196. (Underwater Connections) Or seven nights, four days of diving from \$283. (International Scuba Ventures)



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Divemaster Frazier Nivens caresses his pet Nassau grouper—he named it Hotlips.

RUM CAY CLUB

A Model Dive Resort in the South Bahamas

TEXT AND PHOTOGRAPHY BY GERI MURPHY

Rum Cay is one of those small tropical islands which time forgot — well almost. Once a bustling port-of-call for 18th century sailing ships, this tiny speck of tropical paradise has drifted slowly into a quiet sea of obscurity. With its population dwindling to less than 80 residents, this island community teetered on the brink of extinction when an extraordinary event totally changed its destiny.

The renaissance of Rum Cay is not only a blessing for the Bahamians who live there but also for divers who seek the tranquillity and serene beauty of an untouched tropical isle. The miracle which has helped bring this forgotten Bahamian island back from the depths of anonymity is the advent of a new dive resort. Suddenly, Rum Cay is again a bright star on the map of the Bahama-bound traveler, as virtually hundreds of divers rush to make their bookings at this newest and most exciting scuba vacation spot.

The Rum Cay Club is the perfect model of what an ideal dive resort should be. Although small in size, with limited room accommodations, this unique resort offers all of the modern conveniences and amenities which make a dive resort desirable. With only seven rooms presently available, this little resort can accommodate up to 16 divers. Yet, it offers a wealth of enjoyable vacation services including a hot tub, windsurfing, sailing, island exploration, video games, underwater slide shows, video movies, and a host of other delights. Most important, Rum Cay offers some of the finest virgin coral reefs in the southern Bahamas, and ample opportunity to enjoy truly superb diving. It's the kind of dive resort that most divers dream about, and now that dream has become a reality.

photo/Paul Tzimoulis



Rum Cay patio deck.



Guests load onto tram.



Rum Cay dining room.

RUM CAY

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Underwater Cinematographer

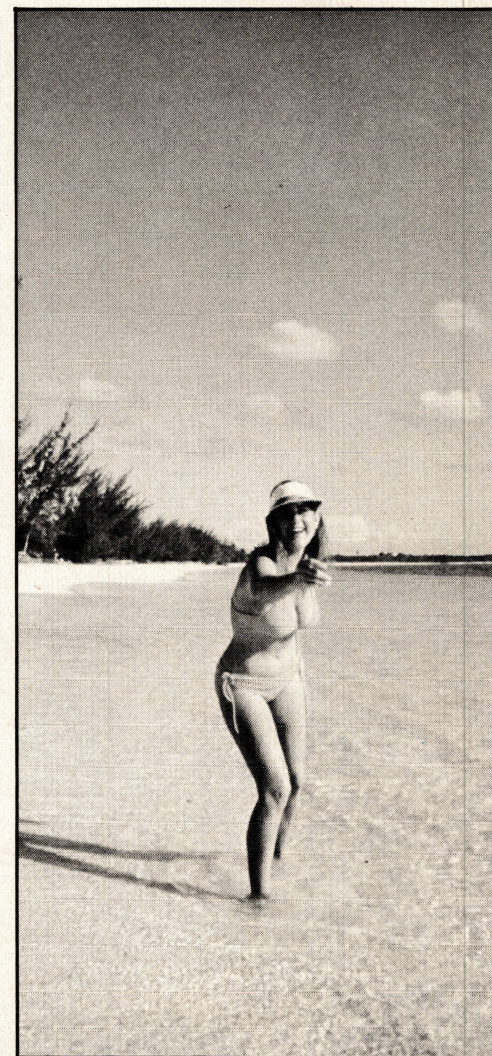
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Rum Cay is definitely off the beaten trail of tourism. Most travel agents have never heard of it or have no idea where it is located or don't know how to get there. Since no commercial airline lands on this island, you will not find it in any of the airline guides or other standard travel references.

Rum Cay is one of the smaller islands of the Bahamas, a mere speck of land measuring five miles wide and twelve miles long. It lies in the southeastern part of the Bahamian archipelago, 375 miles from Ft. Lauderdale. The flight from Ft. Lauderdale takes approximately three hours (special charter flights), including a short stopover in Rock Sound to clear Bahamian Customs and Immigration. Rum Cay is located in an area of the Bahamas sometimes described as the Golden Crescent, positioned halfway between Stella Maris and San Salvador Island.

Almost deserted today, Rum Cay was once an island of industry, and a very busy place. During the 1700's and the 1800's the island was occupied by more than 900 residents. There were six differ-



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ent villages scattered around the island, many farms and a thriving salt industry. In those early days, Rum Cay was regarded as an important port-of-call for sailing ships taking on supplies of salt, fresh water and food. It was one of the last stops before crossing the Atlantic or sailing south to Latin America.

A freak hurricane in 1908 destroyed much of the salt industry facilities, and another hurricane in 1926 wiped out what was left. Without salt production, there was little work available on Rum Cay and most of the islanders began to migrate to other islands in the Bahamian chain. The population continued to dwindle to an all-time low of 70 people in the mid-1970's. Rum Cay became a quiet reclusive island with no industry, no school and little hope for the future.

Unknown to the residents of Rum Cay, or most anyone else for that matter, was the fact that this island possessed an incredible natural resource almost as valuable as gold — the virgin waters and coral reefs below. Because of the tiny resident population and remote location, Rum Cay's coral reefs had

escaped 20th century predation and pollution. The waters around Rum Cay remain crystal clear and abound with healthy coral reefs and fish life. It is the ideal setting for a modest conservation-oriented dive resort.

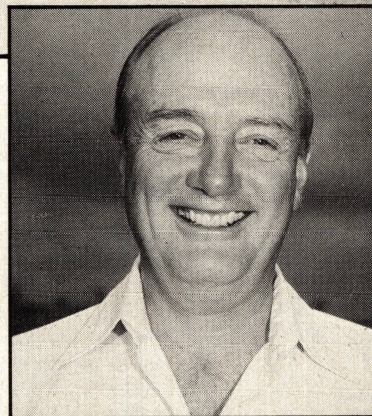
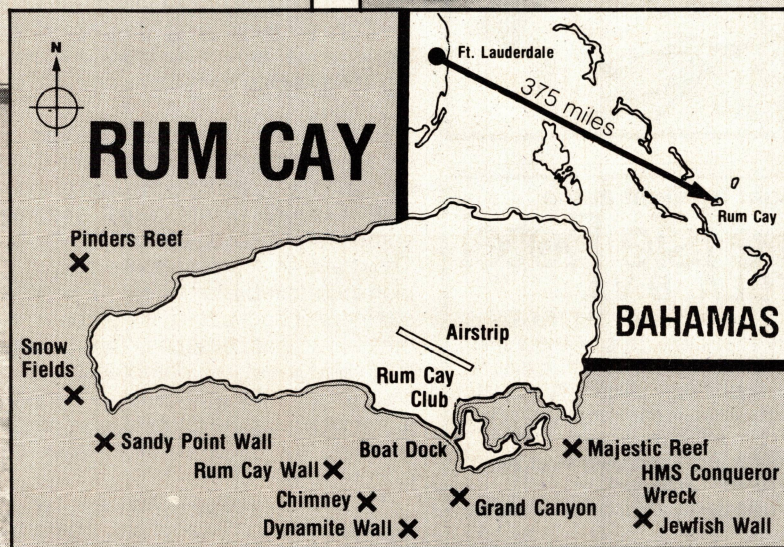
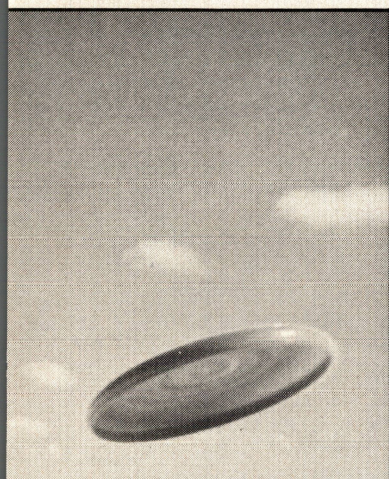
The Rum Cay Club is the result of one man's vision — entrepreneur/philanthropist David Melville of Boston. While the project did not exactly start out as a dive resort, everyone is happy that it has turned out this way. Several years ago, Melville fell in love with the tranquil beauty of Rum Cay while on a sailing trip. His association with the people who lived there developed into a genuine concern for their welfare. The decline in population and lack of work had wrought a great deal of hardship for the remaining residents. He wanted to bring some type of small industry to Rum Cay so that islanders would have jobs and could better their living standards. The question which haunted Melville was what kind of industry could provide work without destroying the natural beauty of the island?

Melville's friends suggested Rum Cay might hold promise for a small, informal

island resort that might possibly cater to fishermen or divers. It was at this point that Melville recruited the talents and services of Tom Ebro, formerly the manager of Spanish Bay Reef, a popular dive resort on Grand Cayman. With Ebro's able assistance, Melville designed and built what could be described as the model dive resort.

The Rum Cay Club facility is almost a beach resort in miniature, but with all of the modern amenities of a big-time hotel. The rooms, dining area, dive shop and other recreational facilities are beautifully designed and within close proximity of the beach.

The Club grounds are neatly kept and the buildings have that freshly-painted look. Each bungalow unit is equipped with futuristic solar panels on the roof for natural water heating. The rooms are nicely decorated, equipped with modern showers and toilet facilities, and have ceiling fans for cooling. The entire resort is wired for 110 volt AC current, as the Club has its own generator plant. Wooden duckboard walkways connect all of the bungalows with the dining room and



Above, David Melville, owner of the Rum Cay Club. Upper, guests board the tram at the dive shop. Opposite, Shari Kurgis with frisbee.

PETER HUGHES'

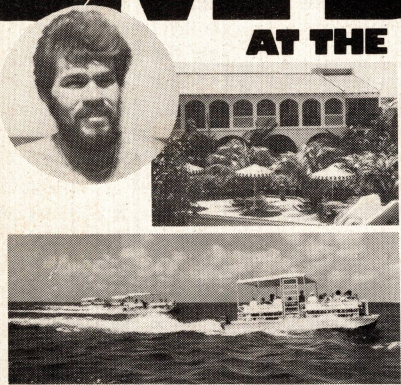
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RUM CAY

the patio deck overlooking the beach.

The main building houses a comfortable informal dining area and a huge ultra-modern kitchen. The meals at the Club are impressive and you can count on gaining a few extra pounds. The culinary delights served by Chef John are simply irresistible, and it is the policy of the club to serve three hot meals a day as part of their normal vacation package.

So far as recreational facilities are concerned, the Rum Cay Club offers more than many beach resorts twice its size. When you are not diving, there is a Hobie Cat for sailing or you can try your skill at windsurfing on the Club's sailboard. One of the most novel beach toys at Rum Cay is a giant see-through plastic inner tube for floating or swimming. Directly in front of the resort, there is a beach area for swimming and a large wooden patio deck for suntanning or barbecue. And if you should decide to tour the island and explore some of the ruins, you can rent a three-wheel motorbike known as a "trike." After diving, you can relax in the Club's hot tub which is adjacent to the patio deck. Another favorite at Rum Cay is sipping a cool island drink while watching the spectacular sunset.

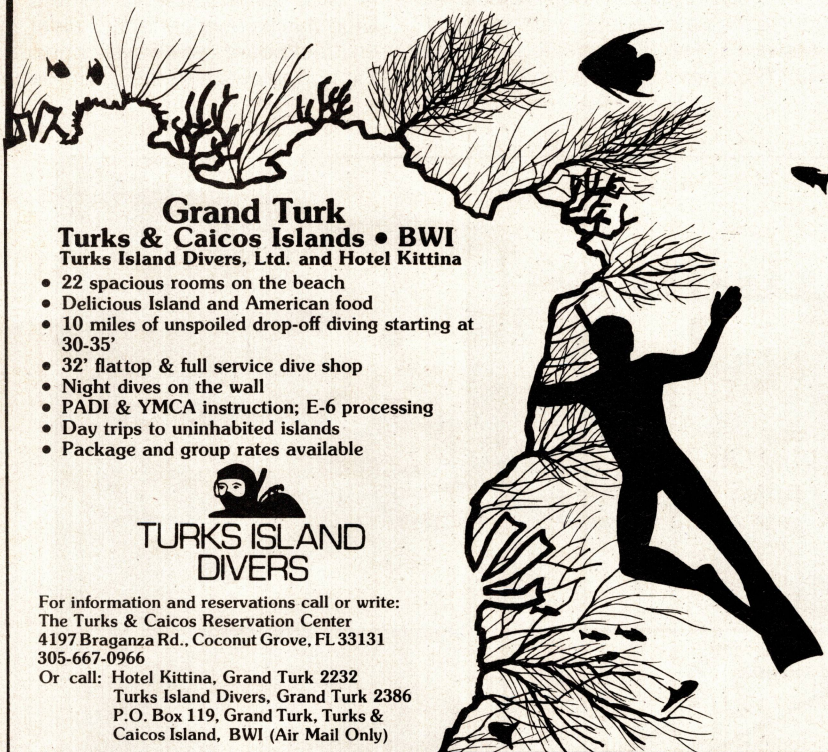
The evenings at the Rum Cay Club are fully occupied with a wide range of activities. After dinner, there is usually a full-length movie shown on the Club's video cassette color TV. In another room, guests spend hours competing at various video games on another TV set. Slide shows on diving are usually presented once or twice weekly by the staff of divemasters and scuba instructors. There is also a library of paperback books for those who prefer to spend a quiet evening reading. Once each week, the Club's guests travel "downtown" for a dinner (local Bahamian food) and dancing at Kay's Bar, Rum Cay's one and only night club.

Also housed in the main building and adjacent to the dining room is the Club's dive shop. Considering the size of the resort, it is one of the nicest and most complete dive shops you will ever find. They have an impressive inventory of 100 aluminum scuba tanks plus a wide assortment of backpacks, weightbelts, and other scuba accessories. There are two large heavy-duty air compressors and a storage bank for additional air supply. It is the policy of the Club to give all dive guests a full 3000 psi fill for maximum bottom time.

The dive shop also features its own underwater photo department. There is a small but adequate darkroom for processing Ektachrome and Fujichrome color slide film using the Unicolor E-6 processing system. Up to six rolls of

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color film can be processed at one time and most dive guests are delighted to find they can get their pictures processed overnight. The dive shop also rents underwater camera equipment, including Nikonos cameras and automatic 35 mm cameras in Ikelite housings. The Club's dive shop and dive activities are under the management of Frazier Nivens, a certified scuba instructor formerly from Tennessee. Frazier and his staff of three divemasters provide highly personalized service which is often unavailable at larger, busier resorts.

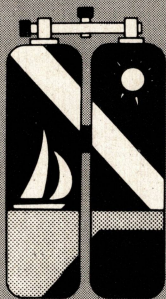
One of the most unique features of the Rum Cay Club is a colorful tram used for transporting guests and their dive gear from the resort to the boat pier — one mile away. A train of two or three small passenger trams are towed behind a jeep, giving the guests a scenic tour of the countryside and nearby village. Dive trips are conducted twice daily, with the morning two tank trip departing at 9:00 am and returning in time for lunch at the resort. The afternoon one tank trip departs at 2:30 pm and returns in time for a shower and afternoon cocktails.

The Rum Cay Club operates its own 34 foot triple-hull flattop as its main dive boat. This is the same type of craft you might find in Bonaire, Cayman or other Bahamian resorts. The flattop is equipped with seats and tank storage racks, capable of accommodating up to 18 divers. The craft is powered by twin 150 hp outboards and moves along at a pretty good clip. The dive boat is equipped with VHF radio for direct communication with the Club, and for scuba safety the boat is equipped with a first aid kit and emergency oxygen.

The island of Rum Cay possesses a wealth of good diving locations, as the island is virtually ringed with coral reefs and vertical drop-offs. There is excellent diving available off all four sides, but most of the diving is presently concentrated along the south and west sides of Rum Cay because of the convenient proximity to the resort. While much of Rum Cay's reefs remain uncharted, the divemasters have already discovered at least 20 really fine dive sites. The very best ones have been pinpointed with moorings and floats so they can be located quickly and not damaged by boat anchors.

One of the prettiest drop-offs is a spot called **The Chimney** which happens to be located very close to the resort. It only takes five minutes to reach by dive boat and yet it is one of the best dives you are likely to make on the south side of the island. The general profile of this drop-off is a densely packed coral reef which starts at a depth of 50 feet and drops vertically to a point well beyond 130 feet. On the top of the reef there is a small hole four feet in diameter which leads to a vertical tunnel or chimney. The chimney descends to a depth of 90 feet where it opens into a large coral cave. The coral

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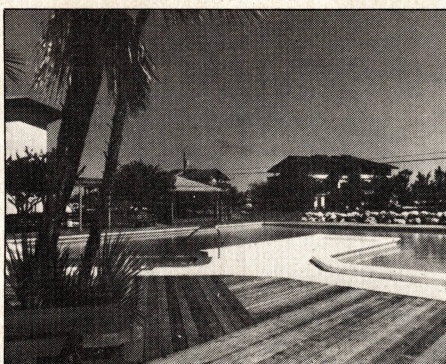
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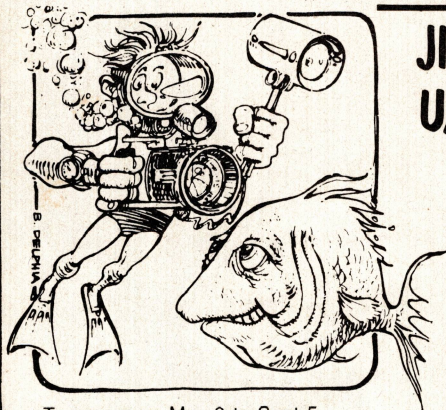
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RUM CAY

cave in turn leads to a canyon which winds its way seaward and empties over the vertical drop-off at a depth of 110 feet. Swimming through this chimney and cave complex is like a trip through wonderland. The visibility is fabulous and the walls of the canyon and cave are lined with all types of beautiful marine life. A short swim from the canyon leads to a prominent coral pinnacle which juts out from the drop-off. The pinnacle is loaded with black gorgonian fans and tube sponges.

Another excellent drop-off less than one-half mile from The Chimney is a spot called **Dynamite Wall**. Here, the top of the wall begins at a depth of 80 feet and is covered with a thick bed of stag-horn coral. The wall drops vertically to 900 feet, and there are dozens of tunnels and narrow canyons etched into the face of the wall. This spot is best known for its abundance of black coral trees which grow along the face of the wall at depths from 120 to 140 feet.

One of the most entertaining medium-depth dives is a spot known as **Majestic Reef**. Diving depths range from 35 to 50 feet, with massive coral ridges and high coral heads rising up from a sandy bottom. This location has become a popular spot for underwater photography ever since Frazier initiated regular fish feeding sessions. He has completely tamed a 30 pound Nassau grouper which he lovingly calls Hotlips. This amazing grouper will allow Frazier to feed it by hand, pet it, cuddle it and carry it around the reef. There is, however, one problem with this grouper. He has developed a voracious appetite and his preference is not necessarily limited to fish fillets or chopped conch. On more than one occasion, Hotlips has developed a more than passing interest in the white strings attached to light meters, cameras and even bikini swim suits. The ensuing tug-of-war between diver and grouper is sometimes embarrassing.

Perhaps the most beautiful coral reef dive at Rum Cay is a spot called **Snow Fields**, located 100 yards off the west side of the island. It is a 45 minute boat ride, but the beauty of this remarkable reef is worth the extra time. The average diving depth is 30 feet and the visibility frequently exceeds 100 feet. The bottom terrain is a fairly flat sand bottom covered with an almost snow-white powdery sand. Rising up from the pure white bottom are hundreds of small coral heads five to eight feet tall. These heads are covered with a dense foliage of sea-fans, seawhips, seaplumes and lovely sponges. It looks like a winter scene high in the Rocky Mountains. Snow Fields is an ideal spot for underwater photog-

(Continued on Page 118)

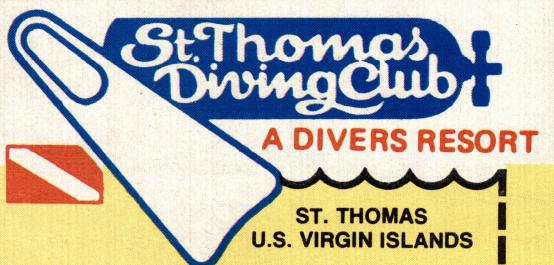
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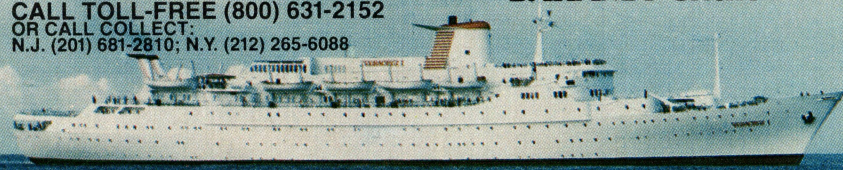


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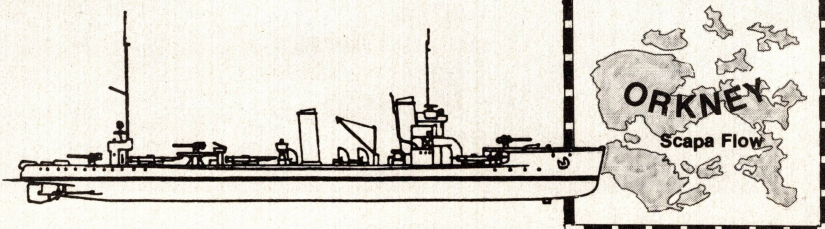
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The dive program begins with departure from the Island of Palawan, located



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REED TO CARIBBEAN ADVENTURES

Dave Reed has joined Caribbean Adventures as head of the diving division. Dave has six years of dive/travel experience and has been a diver the past ten.

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denciales, Turks & Caicos; and Lucayan Bay, Bahamas are some of the new dive destinations Caribbean Adventures will be handling in 1982. Along with these will be the Cayman Islands, Jamaica, Bonaire, and the U.S. Virgins.

For information call Caribbean Adventures: nationwide (800) 237-3803; Florida (800) 282-9178.

CORAL SEA TO FT. LAUDERDALE

Captain Glenn Miller has announced the relocation of the *MV Coral Sea* from Santa Barbara, California to Fort Lauderdale, Florida. The luxury, 85 foot, steel hull dive charter vessel is now berthed at the Marina Inn on the Intercoastal Waterway near the 17th Street Bridge.

The *Coral Sea* will be operating five to seven day dive charters from Ft. Lauderdale to the Bahamas and other islands in the Caribbean. This ultra-modern vessel can sleep up to 40 passengers (Coast Guard approved) but it is limited to 25 divers for purposes of comfort and dive safety.

The craft features satellite and Loran-C navigation, side-scan sonar, two radars, a complete on-board machine shop and two heavy-duty 24 cfm air compressors. Bunk accommodations are dormitory

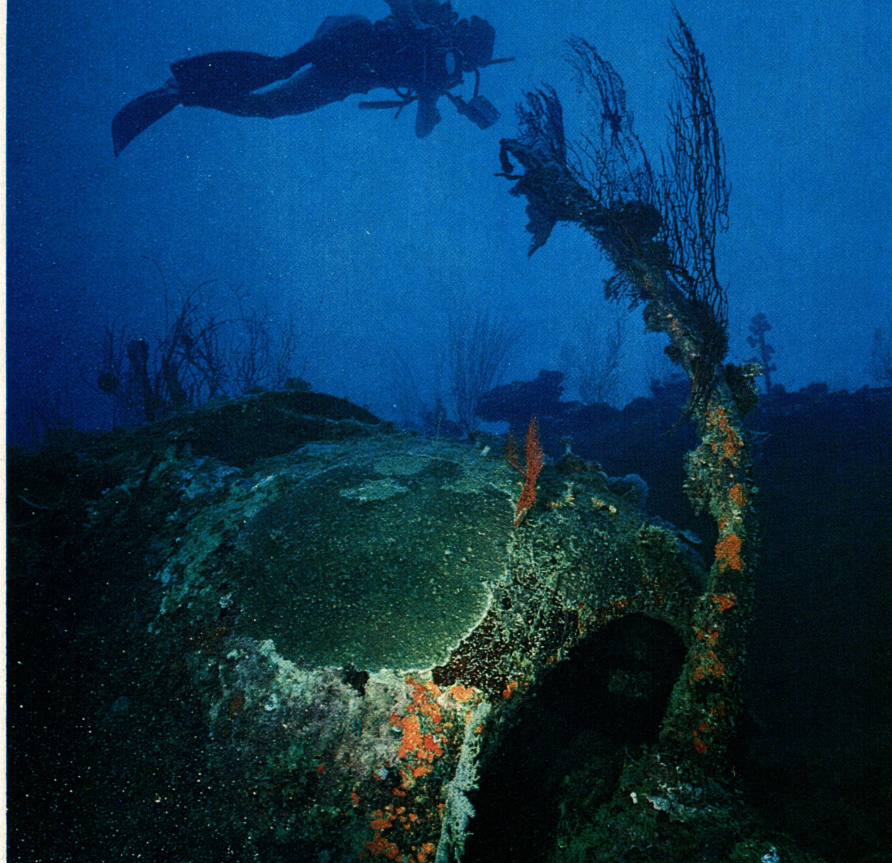


style, with three private heads, three freshwater showers, unlimited fresh water, and air conditioning throughout. The vessel is unique in having a U.S. Coast Guard approved helicopter pad on the upper deck.

Captain Miller has operated dive charter services from Santa Barbara for the last 20 years. He formerly owned and skippered the *Emerald* as a dive charter boat for almost 12 years. The *MV Coral Sea* was designed and built personally by Miller and has been in operation for over seven years. For the past year, the vessel was under charter to a treasure hunting expedition conducting a search for ancient Spanish galleons in the Bahamas and Caribbean.

For more information about the *MV Coral Sea* and available charter dates contact: Captain Glenn Miller, *MV Coral Sea*, c/o Rex Yacht Sales, 2152 S.E. 17th St., Fort Lauderdale, Florida 33316.

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The island government of Bonaire announced it has instituted a departure tax of \$5.75 for visitors from outside the ABC islands. Proceeds will be used to help defray some of the airport maintenance costs.

SCUBACAMP '82

Scubacamp 1982 will be held for the second consecutive year at the Reef House Resort, Roatan, Bay Islands, Honduras. The dates are July 16-30 and July 30-August 13. Scubacamp attracts children ages 12-18 from throughout the U.S. This year, certification courses will be offered in scuba (basic, advanced, and open water), sailing and windsurfing.

Thelma Clark and her staff have been conducting the camp for over 10 years and present not only the athletic side of diving, but also the educational benefits of marine biology and history.

For reservations or information contact: Reef House Resort, 8600 Pontchartrain Blvd., Suite 213, New Orleans, Louisiana 70124.

WORLD CRUISE

On March 1, Mike and Jeannie Kuich, who have chartered out of St. Thomas, U.S.V.I. on *Queen of Sheba* and other boats for the past 14 years, will begin a two year circumnavigation on their Columbia 50, *Stargazer*. The trip is broken up into nine different segments called Hitch-A-Ride Cruises from two to 16 weeks long. Starting at St. Thomas, *Stargazer* will go through the Panama Canal to the Galapagos, Easter Island, Pitcairn Island, Tahiti, Samoa, Tonga, Fiji, the New Hebrides, New Caledonia, New Zealand, Australia, New Guinea, Indonesia, Chagos, the Seychelles, Madagascar, South Africa and return to the Caribbean. Berths are available for as little as \$25 per person per day. For more information contact Mrs. Lynn Jachney, Caribbean Yacht Charters, Inc., P.O. Box 583, Marblehead, MA 01907.

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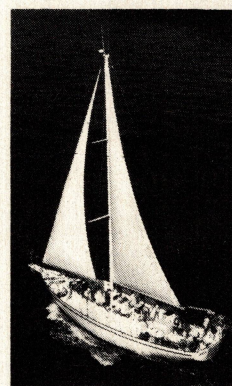
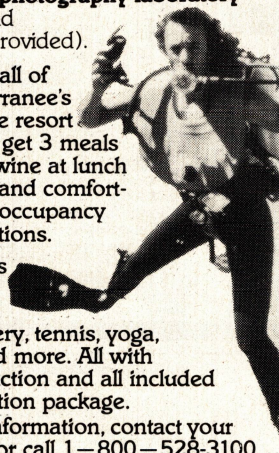
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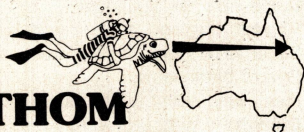
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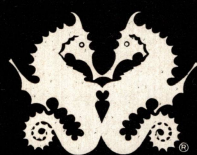
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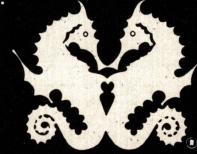
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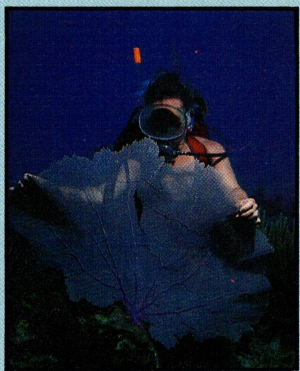
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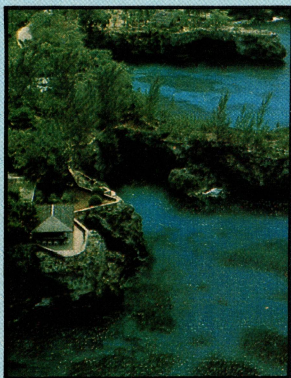


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FEAR FACTOR

(Continued from Page 99)

We grabbed each other's tank valves and swam until we hit steel plate, groping along it with gloved fingers as if trying to read Braille. We continued that way — as if we knew what we were doing — for what most likely was only a few minutes, until I reached out, expecting to hit the wall, and touched nothing. At first I panicked, thinking I had somehow drifted away from the wall — but when I crooked my arm I found myself hugging a finished edge of metal plating. It was a small opening, maybe half the size of the hatchways I'd crawled through, but it was the only game in town.

Since Nick was smaller, he went through first as I hung onto his leg. Then it was my turn. It was incredibly tight, scraping both the paint from my tank and the decal off my BC as I frantically squirmed to get through. To this day I don't know how, but somehow I made it.

The water on this side was infinitely clearer, and I could see we'd come through the top half of the same hatchway at which Nick had first hesitated. It was an eerie, unsettling feeling watching the silt roll out of that opening like dust from a collapsing mine. When I finally pulled my eyes away I could see we were in the lower reaches of the engine room. I couldn't help looking back one last time, from a comfortable distance, and the opening still seemed as tiny as ever.

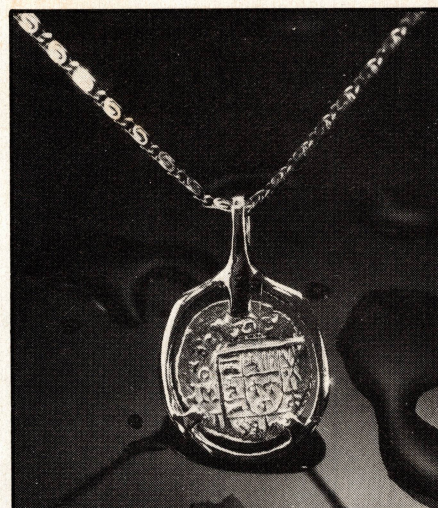
We pulled and kicked our way around the scattered machinery, to the middle of the room where we saw a shaft of light which we followed up to the deck of the ship. We headed straight to the anchor and on up the line as fast as our bubbles would allow, too scared to dare look at our air gauges. My tank ran dry just five feet below the surface — somehow, that seemed appropriate.

Climbing into the boat seemed to take forever, even with the help of those already on board. We were the last ones in, and they were giving us the usual hard time about being slow, bantering back and forth among themselves. I grabbed my bag and started to put away my gear, throwing it down indiscriminately, as I heard Nick drop his tank to the deck behind me.

"We got lost in the wreck," he told them, and the hubbub died. I watched him, curious what he'd say next, the boat so quiet I could clearly hear the waves slapping against the hull. "I was ready, though," he began, "I knew just how to get to my knife when the air went ... I wasn't going to drown."

I wanted to be ill.

Nick launched into his 15 minutes of glory as a Mike Nelson clone, talking of death and the man-eating lobster —



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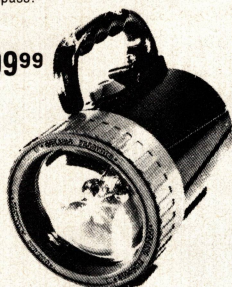
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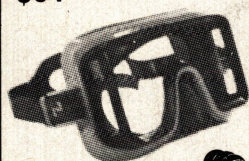
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somehow managing to make the whole fiasco sound noble. If Harry hadn't come over to stop me, I'd have hit the jerk for sure.

"You all right?"

I almost snapped back at him, but then I thought of the doubles he'd talked me out of wearing and that impossibly tiny opening I had squeezed through. "Harry, if you weren't so damn ugly, I'd kiss ya."

Harry gave me an understanding nod and a smile as he backed away — just in case. When I was sick over the side, he was the only one who really knew why.

As with all good fables, there is a moral to this story and the key to this moral is fear. All our lives we are taught to overcome fear, to fight it or, at least, not to show it. Yet not all fear is bad, for it can serve to tell us when a calculated risk becomes a suicidal mission.

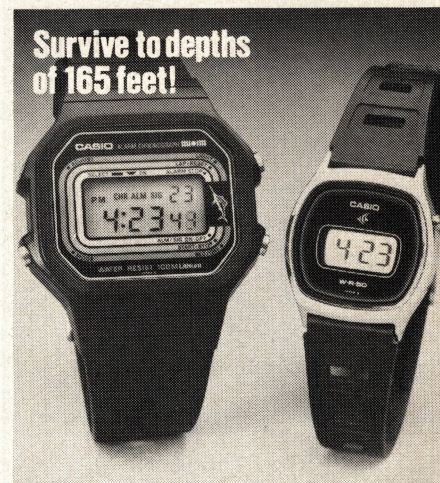
Fear that a great white shark will attack you in your pool is irrational; fear that diving without a flag might cause a boater to run you over is rational; the first should be dismissed as ludicrous, the second should be embraced like an old friend for keeping us from doing the stupid or the idiotic. Rational fear can serve as a barometer of safety, a gauge by which we can tell if it's too risky. I did everything backward, ignoring the rational fear of inadequate precautions and my own inexperience, pushing ahead for fear of being thought a coward. Boiled down to one sentence, I should never have gone anywhere unless I was confident I could get my buddy and myself out of by myself: Since that day I never have.

I should make it clear this is not a plea for paranoia, nor is it a claim that certain types of dives are inherently evil and should be banned — far from it. I've been back to that wreck several times, to the very chamber I found my way out of by Braille; but I was much more experienced, with proper equipment and I never, ever, dragged an unprepared diver back there with me.

Beware the pseudo expert, and don't be afraid to tell him you're not comfortable with the dive — to tell him when the voices in the back of your head say "enough." If he tells you he knows a dive site "like the back of my hand," ask him to describe a few knuckles first before you trust him with your life. He should understand from his own experience that anyone who claims he's never been afraid is either a liar or a fool — never trust a liar, and never dive with a fool.

One final note; always remember that if for some unavoidable reason you should find yourself in a similar situation, never, ever, give up. Keep stroking, keep trying, even if you haven't a chance, because every so often miracles do happen. How else did I pull a 200 pound frame and gear through a 12 by 8 inch hole? >

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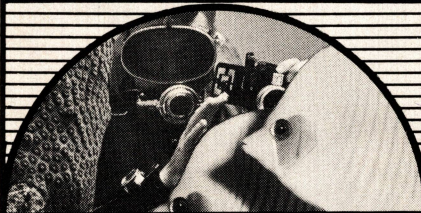
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RUM CAY

(Continued from Page 106)

raphy as the reef is loaded with small fish and all types of invertebrates.

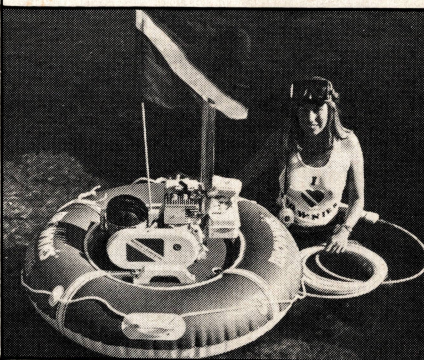
Further north from Snow Fields is a more adventurous dive area known as **Pinder Reef**. This is a long stretch of shallow coral reef which runs off the northwest corner of the island for a distance of two miles. While diving along Pinder Reef is good at most any location, there is one particular coral pinnacle which stands out from the reef and makes a spectacular dive. This coral pinnacle is 75 feet in diameter with almost vertical sides all the way around. It sits on a flat sand bottom in 100 feet of water and rises up to within 40 feet of the surface. The pinnacle is literally covered with large gorgonians and lovely tube sponges. There is a considerable amount of big fish action around this coral pinnacle, including a school of horse-eye jacks, several large barracudas, and two or three reef sharks. It is definitely a high voltage dive.

There are literally dozens of other dive sites equally as exciting as those described. During the period of a one week stay, most Rum Cay Club guests have an opportunity to sample at least 12 to 15 different diving experiences, including a visit to a 101 gun British fighting ship that sank in 1861, and a very impressive night dive. This resort has been specifically designed for the serious diver who is seeking personalized service and lots of diving.



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GUAYMAS

(Continued from Page 91)

through the Bahia sector and turn right onto the dirt road passing through the mountains toward Catch-22 Beach. Bear left as the road approaches the wide, sandy beach (Catch-22).

Deer Island — Located off Catch-22 Beach (named for the filming of the movie Catch-22 which took place here several years ago), it's a long swim from the wide sandy beach, but it offers excellent diving. Either make the swim without tanks (free dive) or launch an inflatable.

San Pedro Island — A visit to Guaymas and San Carlos would not be complete without a boat dive to San Pedro Island. Located seven miles off San Pedro Point and 19 miles from the San Carlos marina, the island offers outstanding visibility, especially during the late summer months, and is a must for underwater photographers and shell collectors. The resident family of sea lions is extremely playful and contributes a great deal of fun to the diving day. Also, because of the extremely deep water surrounding the island (the Sea of Cortez reaches depths of over two miles in places) a great number of pelagic fish cruise by — from dolphins, whales and manta rays to you-name-it.

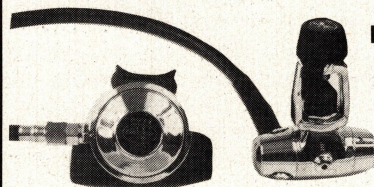
Visibility off the mainland beaches ranges from 30 to 40 feet in the spring to 80 feet in the summer and fall. Visibility off San Pedro Island may exceed 150 feet during some of the best diving months (July through September). If you can withstand the incredible heat topside (well over 100°F), summer is actually the best time for underwater photography and shell collecting.

During April and May, the weather is exceedingly pleasant — with balmy sea breezes and comfortable 70 to 80°F temperatures. However, massive plankton blooms at this time of year often cloud the water, lowering the visibility in spots to a mediocre 15 to 25 feet off the beach and 30 to 50 feet off San Pedro Island. The winter months provide 50 to 60 foot visibility at San Pedro and excellent game fishing. Water temperature at this time of year is about 64°F. It is advisable to wear some protective clothing while swimming or diving all year round — there are small stinging creatures in the water.

Lodging in San Carlos can be obtained at a variety of hotels, motels and trailer parks. Camping on the beaches is permitted in most areas and comfortable beach cottages are also available for rent.

If you're looking for beautiful diving, some of the best shell collecting in the world and an atmosphere guaranteed to soothe the soul — Guaymas is the place! It's far away. But, sometimes, the farther the better. 

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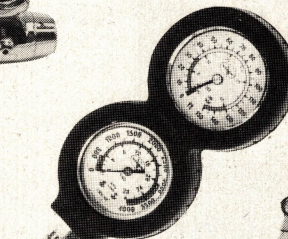
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ST. CROIX BARGAIN

(Continued from Page 93)

unique and memorable experience.

I've been to St. Croix several times in the past and have thoroughly enjoyed every visit. On this trip, the King Christian Hotel (located on the waterfront in Christiansted) became our base of operations, and it was a fortuitous choice. Being right in the center of town it has several advantages, the most significant of which is that a car is not needed.

Caribbean Sea Adventures, operated by Larry Angus, is an excellent dive operation on the King Christian property. There is a retail dive shop, as well as a gear rental facility and dockage for the dive boat, within a few steps of the front entrance of the hotel. Short of a conveyor belt from the room to the dive boat, this is about as convenient an arrangement for transporting cameras and dive gear as anywhere in the Caribbean. There is also an elevator centrally located in the King Christian to ease the load for those in the upper floors.

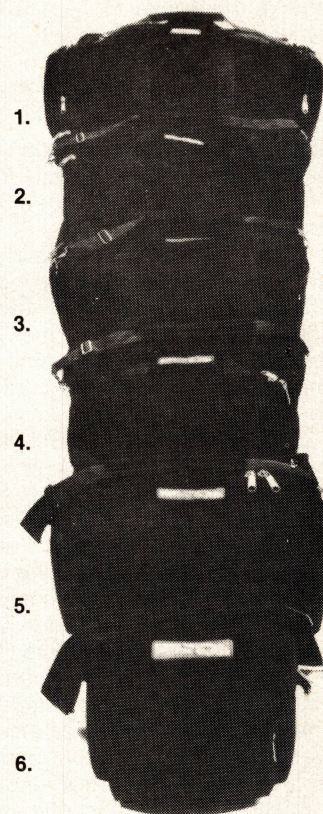
Most of the best restaurants in Christiansted are located within eight blocks of the King Christian. The Chart House is on the premises and serves top quality steaks and seafood in an atmosphere of casual elegance. Other fine restaurants are within walking distance.

There are also several delicatessens which will prepare a box lunch for the surface interval between the first and second dives. The Grandstand offers live rock and roll and drinks.

A wide variety of duty free shopping is available in downtown Christiansted. Perfumes, jewelry and watches, liquor and cigarettes are among the best bargains; and there are excellent leather shops, clothing stores, and fabric shops.

Besides a central location, the King Christian Hotel offers a number of other assets to the visiting diver. More than 20 percent of the hotel's guests are divers and hotel owner, Betty Sperber, is committed to increasing that percentage. Visiting dive groups occupying ten rooms or more qualify for one free room. The 38 rooms are very spacious. Each has two double beds, a balcony overlooking the waterfront (ideal for drying wet dive gear), and central air conditioning. There is a central courtyard that is very nicely landscaped and has a swimming pool.

The seven night dive package at the hotel includes five, two-tank dives. The four night package includes three, two-tank dives. Both packages include round trip transfers between the airport and the hotel as well as free use of necessary scuba gear. Rates are reasonable. For example, the four night package is \$243



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and the seven night package is \$405 per person for a double. For those who wish to go even less expensively, there is a "no frills wing" which is still a quality accommodation but in a different building. Here the floors are tiled rather than carpeted, and the view is not as spectacular as the main section of the King Christian; but the furnishings are identical and each room still has central air conditioning and individual baths. Contact the King Christian Hotel, P.O. Box 3619, Christiansted, St. Croix, USVI 00820 or phone (809) 773-2285 for further package information or room reservations. Specific inquiries on diving should be directed to Larry Angus, Caribbean Sea Adventures, Box 3015, Christiansted, St. Croix, USVI 00820 or phone (809) 773-5922.

There are a few pragmatic considerations which will make it easier to plan and enjoy your King Christian Hotel/Caribbean Sea Adventure holiday. Eastern Airlines offers direct flights to St. Croix from Miami and any traveler who has had to transfer airplanes in Puerto Rico will testify that the direct flight is infinitely preferable. Eastern also offers a fine connecting service to Miami from many major cities such as New York, Los Angeles, Atlanta, Chicago, Boston, Cleveland and Detroit. The hotel owner, Betty Sperber, is a very interesting woman and certainly dedicated to improving the quality of life for the tourist in St. Croix. She's a busy lady but if you ever get the chance, ask her about her days as a personnel manager in New York City for acts such as Jimmi Hendrix and Jesus Christ SuperStar. Or perhaps, ask how she and Larry Angus have devoted their own time and money to train the local police in underwater rescue techniques. 🐠

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For more information on PADI's excellent Instructor Training Courses or the new Business of Diving Modular course, contact PADI Headquarters at 1243 E. Warner Avenue, Santa Ana, CA 92705; (714) 540-PADI 🐠

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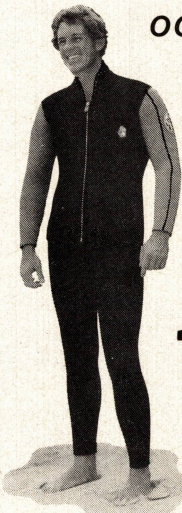
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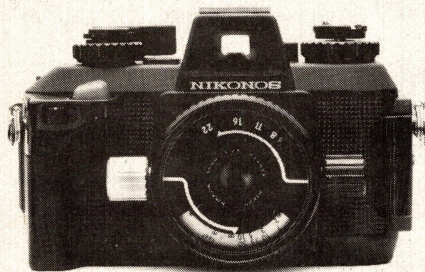


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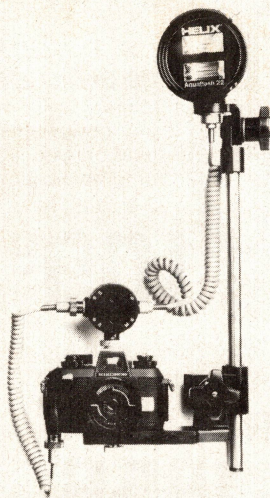
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St. Louis PADI training facilities, along with St. Louis Community College at Meramec, will host a film fest on March 21.

Paul Humann, former captain of the *Cayman Diver*, will speak on marine oceanography and present a unique slide show.

Jack McKenney, world renowned underwater filmmaker and adventure editor for SKIN DIVER Magazine, will speak on underwater photography and present one of his current films.

For more information contact John O'Hanlon, c/o The Dive Shop, 9832 Manchester Road, St. Louis, Missouri; or call (314) 968-8099.

GHOST TRAP SURVEY

An underwater survey of lost or abandoned wire fish traps, commonly known as ghost traps, recently took place off the southeast coast of Florida. The survey, a joint research operation by the National Marine Fisheries Service Southeast Fisheries Center and Harbor Branch Foundation, Inc., of Ft. Pierce, was conducted using *Johnson-Sea-Link I*, a unique deep-diving vehicle capable of working in depths to 2000 feet.

Over 43 hours of bottom time were logged by scientists in 16 separate dives as the Harbor Branch submersible traversed known trap fishing grounds from the Dry Tortugas to Triumph Reef off Miami. Wire fish traps and other objects were detected visually from the submersible and by the submersible's sonar. Poor weather and low visibility restricted operations off the Dry Tortugas and no traps were sighted, but from American Shoals off Key West to Triumph Reef off Miami scientists reported sighting 23 ghost traps in depths ranging from 40 feet to 115 feet. Eighteen had been damaged in some way and were no longer capable of capturing and holding fish. Five were intact and did contain fish and numerous lobsters. The fish, mostly groupers, appeared to be relatively healthy and in good condition except for abrasions around the snout. There was no way to determine how long the traps had been in the water, continuing to fish.

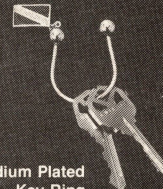
In addition, 12 wire fish traps were observed to be actively fishing and they all contained fish of various species. The scientists also sighted numerous lost or abandoned wooden lobster traps — all of which were damaged to some extent — along with hundreds of yards of buoy lines lying on the bottom or, in many cases, drifting above the bottom. Many of the ghost traps were discovered on the reef itself, however, the scientists were unable to detect any obvious damage to corals or plants around or under the

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traps. When the traps were observed on sandy bottoms, well away from any reef area, they were covered with various types of marine growth and seemed to serve as havens for adults and juveniles of various species of fish and invertebrates.

No firm conclusions could be drawn as to the total extent to which ghost traps continue to catch fish after having been lost or abandoned. More detailed studies are currently underway at the Center's Miami Laboratory to resolve the question of the occurrence and extent of fish mortality in wire ghost traps. »

ANTHONY'S KEY RESORT

Anthony's Key Resort has made major changes in its operation and in its U.S. sales offices. Taking charge of all aquatic activities will be Peter Hughes, who is expanding his dive operation from the Flamingo Beach Hotel on Bonaire, where he is well known for the quality of his operation and equipment. Peter says he is very excited about being back in Roatan, and at Anthony's Key, where he was divemaster six years ago. Working with him as divemasters will be Herby and Sammy, familiar names to AKR's past clients. The main U.S. reservation office will be moved to Minneapolis, Minnesota, with an additional office located in the Dallas area for the southwestern region.

Anthony's Key is offering, for 1982, a divers package for \$449, which will include: seven nights lodging (based on double occupancy), all meals, transfers, taxes, and gratuities. Four boat dives, with extra tanks, are available for critter dives. Also, at no extra charge, guests have use of the tennis courts, sailboats and horseback riding. There is a non-diving package including all of the above for \$349. These prices are based on the group rate (ten or more). Individual rates are also available.

For more information and free brochures, write Anthony's Key Resort, P.O. Box 26556, St. Louis Park, MN 55426; phone (800) 328-0734 — or 3803 Wagonwheel Ct., Plano, TX 75023. »

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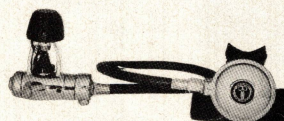
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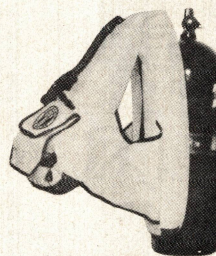
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STONE TREASURE

TEXT AND PHOTOGRAPHY
BY DON BURGER

The throb of the 671 "Gimmy" diesel could be heard overhead as it ran the air compressor supplying air for the hooka rig. Visibility was down to ten feet and I was working an eight inch ledge, fifty feet down, briskly raking sea urchins into the net bag. I separated another sea urchin from a larger cobble-stone and pushed the stone behind me; but not before my eyes caught sight of a deep depression on the bottom side of the stone.

I quickly grabbed the stone back, taking a closer look, and found it to be an Indian mortar bowl. I was thrilled by the find, knowing it would be a great addition to the collection of gold relics I had at home. I stuffed it into the top of a full bag of sea urchins and returned to work.

Mortar bowls, pestles, and ceremonial stones are just a few of the ancient Indian artifacts you can find lying in the La Jolla and Point Loma kelp beds. Some of these artifacts have been dated to be between 5000 and 8000 years old by the leading West Coast underwater anthropologist, Dr. James Moriarity.

I visited Dr. Moriarity a week later while bad weather churned up the coast, keeping most of the smaller boats in port. By this time I had found another stone. I came across it the day after I found the bowl and in the same area, off Point Loma. The second stone immensely spurred my curiosity. I wasn't sure whether it was an artifact or not, but I thought I would bring it along.

It was spherical with a ridge running nearly all the way around the center, protruding about a quarter of an inch above the rest of the stone. One section of the ridge had been worn down and a few holes made into it by boring clams.

Dr. Moriarity inspected the bowl and stone ball with deep curiosity. A few moments later I was bombarded with a barrage of questions.

He identified the bowl as being made of granite and the spheroid as a granite anchor. I anticipated them being hundreds of years old. When I was told both artifacts were between 5000 and 8000 years old, I was quite surprised. I had never heard of Indian artifacts in this area being thousands of years old. Few people have considered the existence of Indian campsights 50 feet underwater.

The ridge around the center of the stone anchor is where two baskets were

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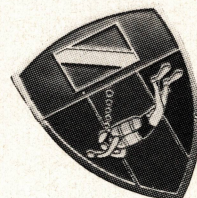
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woven together and an anchor line was spliced in.

The depth was significant. I had found the stones in the 50 to 60 foot range, which was the coastline at about that time. Anthropologists studying these artifacts theorize that man first came to the Southern California coast about 8000 years ago.



In two years of diving for sea urchins, I have assembled a small collection of artifacts and stone concretions. The artifacts include bowls, pestles, a net weight, a stone anchor, a ceremonial stone, a grinding stone and the location of a possible altar or sacrificial stone. Whether this large (six by eight foot) stone is truly a sacrificial stone or altar is of yet, unknown. It lies off the North Bird Rock area in 45 feet of water, about half a mile from shore. The stone stands about 18 to 24 inches high and has a two inch depression in the face that forms a nearly perfect circle. The sides uniformly curve in toward the bottom and I estimate the stone to weigh about ten tons.

About 50 feet away, toward deeper water, is another stone, similar in shape but much smaller in size, and broken in three major sections. The sandstone bottom in this area terraces downhill from 35 feet and visibility is usually poor.

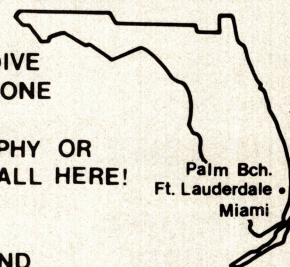
Although several of the bowls which I have donated to Scripps Institution of Oceanography (La Jolla, CA) were made of sandstone, granite was primarily used by the Indians of that time because it was hard, easy to come by, workable and heavy.

Some of the artifacts discovered in the La Jolla and Point Loma area were not built from local material. I found this out after recovering a black granite bowl. The bowl has since turned to a dark gray. Even so, it is still much darker than any of the other bowls I have recovered. Another artifact, a sandstone metate, was also recognized by a known local geologist as not being from the San Diego area.

A diver can be fooled by some of the stones if he or she is not careful. I assembled quite a collection of stone concretions. Some concretions look very much as though they were man made and yet, they were formed by nature. Concretions are created by the formation of succeeding layers of mineral

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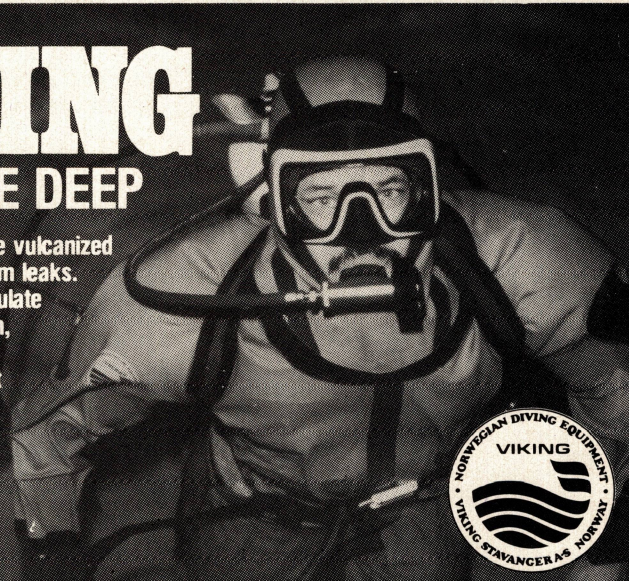
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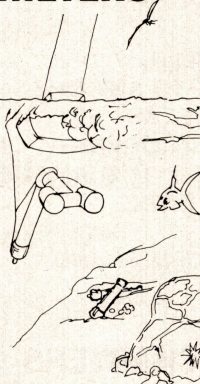
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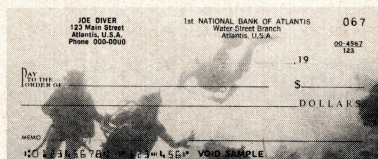
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The research arm of the Cayman Turtle Farm Ltd. is restocking Cayman waters with over 3000 green sea turtles and scuba divers are releasing the turtles in their underwater homeland.

The Cayman Turtle Farm Ltd. also produces turtle meat and turtle products such as jewelry and cosmetics for export. Responding to what many ecologists regard as an ill-considered ban on turtle products in the United States, the Cayman facility is slowing down its commercial operations.

"But we are keeping the research department intact," said Dr. Jim Wood, director of the research facility. "We are releasing the turtles and studying how well they adapt in their natural environment and their ability to repopulate."

For a \$5 fee, divers take a turtle on their dive and swim with it as it is released. Participants in the program include Sunset House, Casa Bertmar, F.L.A.G. Dive Services at the Royal Palms Hotel, Scuba Cayman Ltd., and Bob Soto's Diving Ltd. Also participating are underwater photographers Bonnie Charles and Dickie Wells.

All turtles released are tagged and numbered by the Turtle Farm Research Department. Later this year, an experimental group of turtles will be given a special skin graft on their shells which is expected to identify them as long as they live — long after conventional tags have worn off. Turtle Farm biologists are tracking the turtles to note their dispersion around the Cayman Islands, taking particular note of their feeding habits. "We have sighted a number of the turtles already," said Dr. Wood. "They are in a nice dispersion."

Scientifically reared turtles actually have a better chance of surviving to maturity than turtles hatched in the wild, according to Dr. Wood. "By head starting the turtles and releasing them when they are older and stronger, predators can't hit them while they are hatchlings. Young turtles, about a year old, have a much higher survivability rate than hatchlings."

Several hundred turtles have already been released, and the program will continue through the year. Divers visiting the islands aren't the only visitors who can free turtles. For the same \$5 fee, turtles can be released from a specially built platform during a tour of the Cayman Turtle Farm.

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by Robert L. Straight

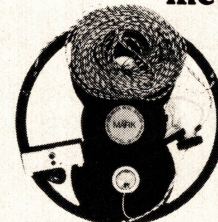


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STONE TREASURE

matter around some nucleus such as a fossil or a grain of sand. Some of the stone concretions I came up with had unusual shapes such as tusks, mushrooms, balls, and even large grinding tables weighing over 200 pounds.

Over the span of a year, I had taken notice of three different types of terrain in which I found most of my artifacts. These areas also proved to be good for finding old bottles. Small gullies and ravines, mostly the ones which parallel the shoreline, are always worth checking. Once a bowl falls into one of these natural traps, it usually remains there.

Small rockpiles or reefs are other areas. Look near the bases of these terrain irregularities, facing the shore. Heavy objects can lodge here.

Another good area to check is the rubble near ledges, on the side facing deeper water.

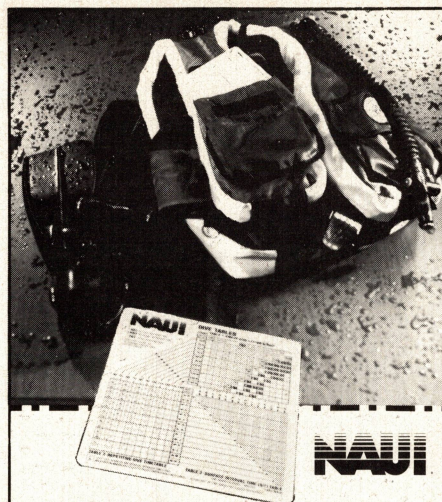
Bowls are usually found lying bottom up. When right side up on a hard bottom, they are more likely to rock and roll around, even under moderate swell conditions. A strong enough swell will flip the bowl over. When a bowl is lying upside down, it is harder to spot and appears as any other stone in the area.

Nearly all the bowls I have found had some kind of coral or other shell growth on them. I prefer to keep this on my artifacts as evidence that I found them underwater. For those who would want to clean their artifacts I would suggest soaking in a mild solution of either muriatic acid or a bottle of white distilled vinegar.

In several areas I have found artifacts lying close together. This was the case on my last day of diving off Point Loma. What a day it was. The sun was shining, the sea was calm, and I found four bowls that day, even though visibility was only six to eight feet. Three of the bowls were lying bottom up along a gentle slope. The fourth bowl was bottom up on the shore side of a large rock.

There are many more bowls and other artifacts left there for the diver with a keen eye. I only scratched the surface. If you happen to come across an artifact, you'll probably want to know more about it. If you are going to recover the artifact and are planning to bring your find to Scripps for identification, take a good look around and remember as much about the area as you can. They will need to know as much as you can tell them about the area. In return they will give you as much information about your find as possible. You may keep your artifact or donate it to their museum if you like. This is up to you.

The people to contact at Scripps are Pat and Douglas Inman. They will be very interested in seeing what you have found, and can be reached at (714) 452-4334 or 452-2995.



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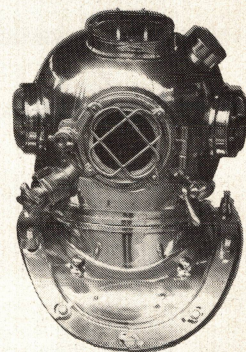
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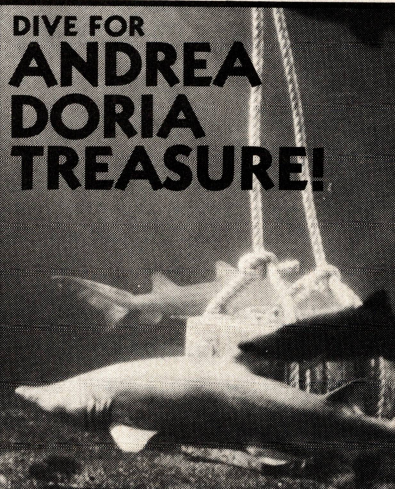
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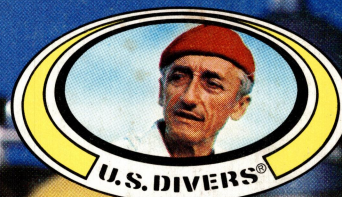
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